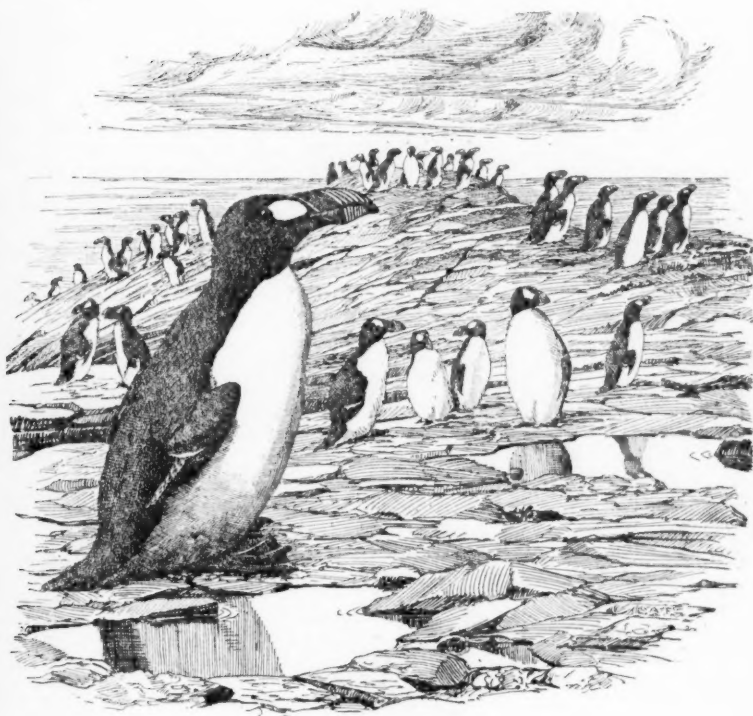


OLD SERIES, } CONTINUATION OF THE { NEW SERIES,
VOL. XXXVIII } BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB { VOL. XXX.

The Auk

A Quarterly Journal of Ornithology

EDITOR
WITMER STONE



VOLUME XXX

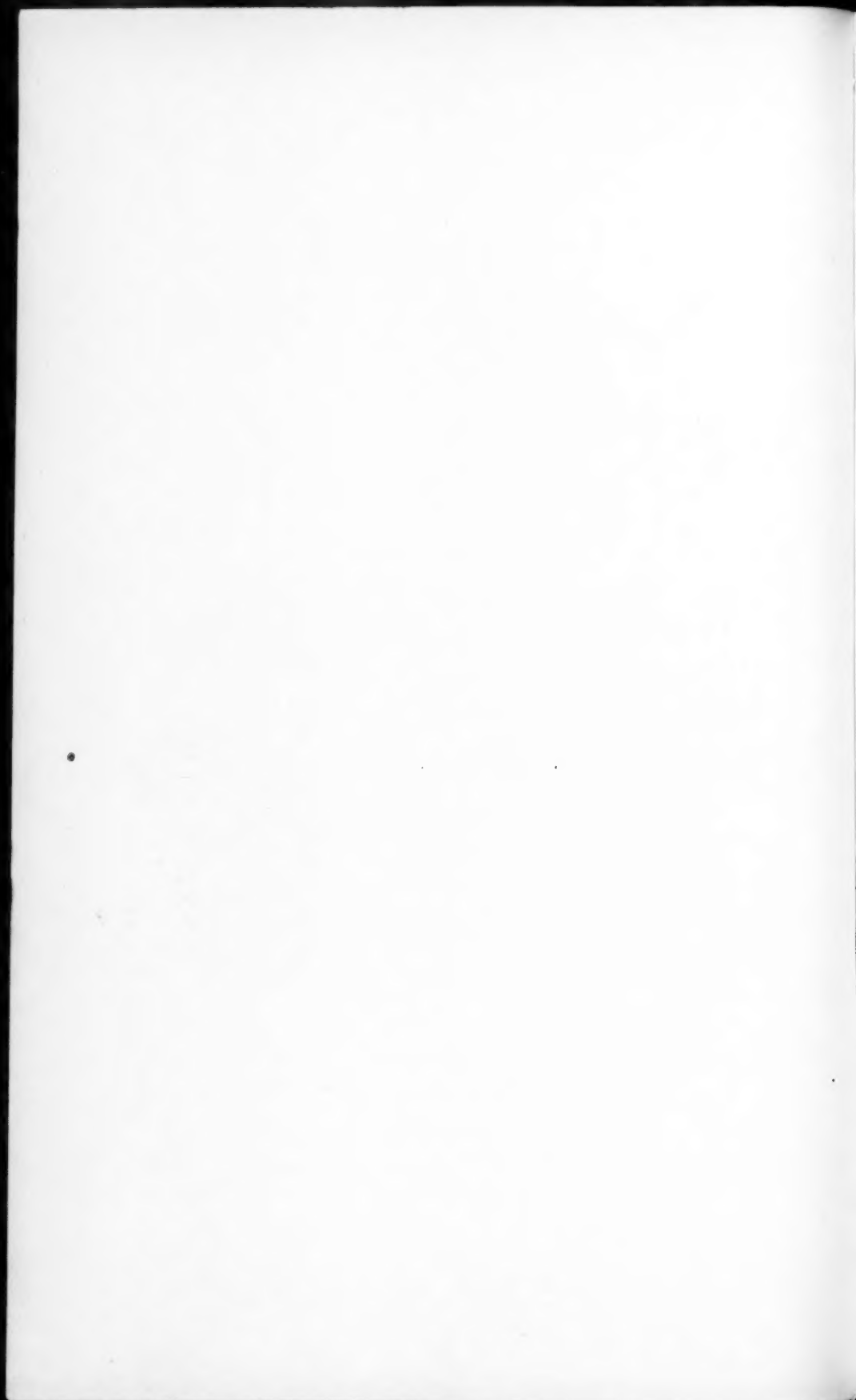
PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

1913

Entered as second-class mail matter in the Post Office at Boston, Mass.



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SCLATER, Dr. PHILIP LUTLEY, Athenæum Club, Pall Mall, London, S. W.....	1883
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WALLACE, Prof. ALFRED RUSSEL, Broadstone, Wimborne, Dorset, England.....	1883

CORRESPONDING FELLOWS.

ALFARO, ANASTASIO, San José, Costa Rica.....	1888
ARRIGONI DEGLI ODDI, Count E., University of Padua, Italy.....	1900
BONHOTE, JOHN LEWIS, Gade Spring Lodge, Hemel Hempstead, Herts, England.....	1911
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France.....	1884
BUTLER, Lieut.-Col. E. A., Winsford Hall, Stokesby, Great Yarmouth, England.....	1884
BÜTTIKOFER, Dr. JOHANNES, Zoölogical Garden, Rotterdam, Holland.....	1886
BUTURLIN, SERGIUS A., Wesenberg, Esthonia, Russia.....	1907
CAMPBELL, ARCHIBALD JAMES, Melbourne, Australia.....	1902
CARRIKER, M. A., JR., Cincinnati Coffee Co., Santa Marta, Colombia.....	(1907)1912
CHAMBERLAIN, MONTAGUE, Cambridge, Mass.....	(Founder)1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W.....	1911
CLARKE, WILLIAM EAGLE, Museum of Science and Art, Edinburgh.....	1889
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.....	1883
DOLE, SANFORD B., Honolulu, Hawaiian Islands.....	1888
DUBOIS, Dr. ALPHONSE, Museum Natural History, Brussels.....	1884
ECHE, ADOLPH BACHOFEN VON, Nussdorf, near Vienna.....	1883
EVANS, ARTHUR H., 9 Harvey Road, Cambridge, England.....	1899
FEILDEN, Col. HENRY W., Burwash, Sussex, England.....	1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....	1885
FREKE, PERCY EVANS, Southpoint, Limes Road, Folkstone, Kent, England.....	1883
FÜRBRINGER, Prof. MAX, Director Anatom. Institute, University of Heidelberg, Heidelberg, Germany.....	1891
GADOW, Dr. HANS, University Museum of Zoology, Cambridge, England.....	1884
GIRTANNER, Dr. A., St. Galle, Switzerland.....	1884
GODWIN-AUSTEN, Lieut.-Col. H. H., Nore, Hascombe, Godalming, Surrey, England.....	1884
GOELDI, Prof. Dr. EMIL A., Zieglerstrasse 36, Bern, Switzerland.....	1903
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris.....	1883

GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
HARTING, JAMES EDMUND, Edgewood, Weybridge, Surrey, England..	1883
HENNICKE, DR. CARL R., Gera, Reuss, Germany.....	1907
HENSON, HARRY V., Yokohama.....	1888
HERMAN, OTTO, Budapest, Hungary.....	1908
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W.....	1895
KRUKENBERG, DR. E. F. W., Würzburg, Germany.....	1884
KRÜPER, DR. THEOBALD J., University Museum, Athens, Greece....	1884
LEGGE, COL. WILLIAM V., Cullenswood House, St. Mary's, Tasmania..	1891
LE SOUËF, DUDLEY, Zoological Gardens, Melbourne, Australia....	1911
MACFARLANE, RODERICK, Winnipeg, Manitoba.....	1886
MADARÁSZ, DR. JULIUS VON, National Museum, Budapest, Hungary..	1884
MATHEWS, GREGORY M., Langley Mount, Watford, Herts, England..	1911
MENZBIER, Prof. DR. MICHAEL, Imperial Society of Naturalists, Moscow.....	1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, Sussex, England.	1911
NAMIYE, M., Tokio.....	1886
NICHOLSON, FRANCIS, The Knoll, Windermere, Westmoreland, Eng- land.....	1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales..	1902
Ogilvie-Grant, WILLIAM ROBERT, British Museum (Nat. Hist.), Cromwell Road, London, S. W.....	1899
PALMÉN, DR. J. T., Helsingfors, Finland.....	1883
RAMSEY, E. P., Sydney, New South Wales.....	1884
RINGER, FREDERIC, Nagasaki.....	1888
ROTHSCHILD, Hon. LIONEL WALTER, Zoological Museum, Tring, England.....	1898
SLATER, WILLIAM LUTLEY, 10 Sloane Court, Chelsea, London, S. W..	1906
SUSHKIN DR. PETER, Imperial University, Moscow.....	1903
THEEL, DR. HJALMAR, University of Upsala, Upsala, Sweden.....	1884
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....	1884
WATERHOUSE, F. H., 3 Hanover Square, London, W.....	1889
WINGE, DR. HERLUF, University Zoological Museum, Copenhagen...	1903
WORCESTER, Prof. DEAN C., Manila, P. I.....	1903
ZELEDON, Don José C., San José, Costa Rica.....	1884

MEMBERS.

ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....	(1888)1901
ALLEN, DR. GLOVER M., 234 Berkeley St., Boston, Mass.....	(1896)1904
ALLISON, ANDREW, Southern Presbyterian Mission, Kiangyui, China.....	(1897)1902
ATTWATER, H. P., Box 697, Houston, Texas.....	(1891)1901

- BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C. . . . (1887)1901
 BAILEY, Mrs. VERNON, 1834 Kalorama Ave., Washington, D. C. (1885)1901
 BAILY, WILLIAM L., Ardmore, Pa. (1885)1901
 BARBOUR, Prof. ERWIN H., Univ. of Nebraska, Lincoln, Neb. . . (1892)1903
 BARTSCH, PAUL, Smithsonian Inst., Washington, D. C. (1896)1902
 BOND, FRANK, 3127 Newark St., Cleveland Park, Washington, D. C. (1887)1901
 BOWLES, JOHN HOOPER, Tacoma, Wash. (1891)1910
 BRAISLIN, Dr. WILLIAM C., 556 Washington Ave., Brooklyn, N. Y. (1894)1902
 BROOKS, ALLAN, Okanagan Landing, B. C. (1902)1909
 BROWN, HERBERT, Tucson, Arizona. (1885)1901
 BRYAN, WILLIAM ALANSON, College of Hawaii, Honolulu, Hawaiian Islands (1898)1901
 BURNS, FRANK L., Berwyn, Pa. (1891)1901
 BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind. (1885)1901
 CAMERON, E. S., Marsh, Montana. (1903)1910
 CLARK, AUSTIN HOBART, 1726 18th St., N. W., Washington, D. C. (1899)1901
 CLARK, Prof. HUBERT LYMAN, Museum of Comparative Zoölogy, Cambridge, Mass. (1886)1902
 DAGGETT, FRANK S., 2833 Menlo Ave., Los Angeles, Cal. (1889)1901
 DAWSON, WILLIAM LEON, Santa Barbara, Cal. (1895)1905
 DEANE, WALTER, 29 Brewster St., Cambridge, Mass. (1897)1901
 DEARBORN, NED, Linden, Md. (1902)1907
 EATON, ELON HOWARD, Hobart College, Geneva, N. Y. (1895)1907
 EVERMANN, Prof. BARTON W., Bureau of Fisheries, Washington, D. C. (1883)1901
 FINLEY, WILLIAM L., 651 East Madison St., Portland, Ore. . . . (1904)1907
 FLEMING, JAMES H., 267 Rusholme Road, Toronto, Ontario. . . (1893)1901
 GAULT, BENJAMIN TRUE, Glen Ellyn, Ill. (1885)1903
 GOLDMAN, EDWARD ALFONSO, Biological Survey, Washington, D. C. (1897)1902
 HOFFMANN, RALPH, 11 W. Concord Ave., Kansas City, Mo. . . (1893)1901
 HOLLISTER, NED, U. S. Nat. Museum, Washington, D. C. . . . (1894)1910
 HOWELL, ARTHUR H., 2919 S. Dakota Ave., Washington, D. C. . (1889)1902
 JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa. . (1889)1904
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 JOB, Rev. HERBERT K., 291 Main St., West Haven, Conn. (1896)1901
 JORDAN, Prof. DAVID STARR, Stanford University, Cal. (1885)1901
 KENNARD, F. H., Dudley Rd., Newton Centre, Mass. (1892)1912
 KNIGHT, ORA WILLIS, 81 Brighton Ave., Portland, Me. (1893)1907
 KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C. (1883)1902
 McATEE, WALDO LEE, Biological Survey, Washington, D. C. . . (1903)1910
 MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass. . . . (1890)1901
 MAILLIARD, JOHN W., 300 Front St., San Francisco, Cal. (1895)1901
 MAILLIARD, JOSEPH, 300 Front St., San Francisco, Cal. (1895)1901

- MILLER, MRS. OLIVE THORNE, 5928 Hays Ave., Los Angeles, Cal. (1887)1901
 MILLER, WALDRON DEWITT, Amer. Mus. Nat. Hist., New York City
 (1896)1906
 MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa. (1887)1903
 MORRIS, ROBERT O., 82 Temple St., Springfield, Mass. (1888)1904
 MURDOCH, JOHN, Public Library, Boston, Mass. (1883)1901
 NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Maine
 (1890)1902
 PEARSON, T. GILBERT, 1974 Broadway, New York City. (1891)1902
 PENNOCK, CHARLES J., Kennett Square, Pa. (1888)1901
 PHILLIPS, JOHN C., Wenham, Mass. (1904)1912
 PREBLE, EDWARD A., 3027 Newark St., Washington, D. C. (1892)1901
 RATHBUN, SAMUEL F., 217 14th Ave., N., Seattle, Wash. (1893)1902
 RHODS, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J. (1885)1901
 RILEY, JOSEPH H., U. S. National Museum, Washington, D. C. (1897)1905
 RIVES, DR. WILLIAM C., 1702 Rhode Island Ave., Washington, D. C.
 (1885)1901
 ROBINSON, COL. WIRT, U. S. A., West Point, N. Y. (1897)1901
 SETON, ERNEST THOMPSON, Cos Cob, Conn. (1883)1901
 *SHERMAN, MISS ALTHEA R., McGregor, Iowa. (1907)1912
 STEPHENS, FRANK, R. F. D. No. 2, San Diego, Cal. (1883)1901
 STRONG, DR. REUBEN M., Dept. Zoöl., Univ. of Chicago, Chicago, Ill.
 (1889)1903
 SWALES, BRADSHAW HALL, Grosse Isle, Mich. (1902)1909
 SWARTH, HARRY S., Mus. Vert. Zool., University of California, Berkeley, Cal. (1900)1909
 TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada
 (1902)1909
 THAYER, JOHN ELIOT, Lancaster, Mass. (1898)1905
 TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa. 1890)1901
 TOWNSEND, CHARLES H., Aquarium, Battery Park, New York City
 (1883)1901
 TOWNSEND, DR. CHARLES WENDELL, 76 Marlborough St., Boston, Mass. (1901)1905
 TROTTER, DR. SPENCER, Swarthmore College, Swarthmore, Pa. (1888)1901
 WARREN, EDWARD ROYAL, 20 West Caramillo St., Colorado Springs, Colo. (1902)1910
 WAYNE, ARTHUR T., Mt. Pleasant, S. C. (1905)1909
 WETMORE, ALEX., Biological Survey, Washington, D. C. (1908)1912
 WOLCOTT, DR. ROBERT H., Univ. of Nebraska, Lincoln, Neb. (1901)1903
 WOOD, NORMAN A., Museum Univ. of Mich., Ann Arbor, Mich. (1904)1912
 WRIGHT, MRS. MABEL OSGOOD, Fairfield, Conn. (1895)1901

ASSOCIATES.

ABBOTT, CLINTON GILBERT, 153 W. 73rd St., New York City.....	1898
ADAMS, BENJAMIN, 476 5th Ave., New York City.....	1911
ADAMS, WALLACE, Los Molinos, Cal.....	1901
ADAMS, Dr. Z. B., 43 Cottage Farm Rd., Brookline, Mass.....	1908
AIKEN, CHARLES EDWARD HOWARD, 12 Pikes Peak Ave., Colorado Springs, Colo.....	1898
AIKEN, Hon. JOHN, Orchard St., Greenfield, Mass.....	1905
ALEXANDER, Miss ANNIE M., 92 Sea View Ave., Piedmont, Cal.....	1911
ALLEN, ARTHUR A., 707 East State St., Ithaca, N. Y.....	1909
ALLISON, WILLIAM B., 7916 Plum St., New Orleans, La.....	1905
ANDERSON, Mrs. J. C., Great Barrington, Mass.....	1903
ANDERSON, Dr. RUDOLPH M., Am. Mus. Nat. History, N. Y. City.....	1907
ANDREWS, ROY C., Amer. Mus. Nat. Hist., New York City.....	1906
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.....	1901
ANTHONY, H. E., Amer. Mus. Nat. Hist., New York City.....	1911
ARCHBOLD, JOSEPH A., 107 Hodge Ave., Buffalo, N. Y.....	1903
ARMSTRONG, EDWARD E., 125 N. Wabash Ave., Chicago, Ill.....	1904
ARMSTRONG, Mrs. E. H., Hyde Park, Boston, Mass.....	1912
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....	1894
ARNOLD, F. E., 284 Pleasant St., East Providence, R. I.....	1909
ARNOLD, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo.....	1910
AVIS, EDWARD, Box 56, Enfield, Conn.....	1908
BABCOCK, DEAN, 731 Spruce St., Boulder, Colo.....	1911
BABSON, Mrs. CAROLINE W., 182 Granite St., Pigeon Cove, Mass.....	1912
BABSON, W. A., South Orange, N. J.....	1901
BAGG, EGBERT, 424 Genesee St., Utica, N. Y.....	1883
BAILEY, Prof. G. A., Geneseo, N. Y.....	1910
BAILEY, HAROLD H., 320 50th St., Newport News, Va.....	1903
BAILEY, SAMUEL WALDO, Box 212, Newburyport, Mass.....	1909
BAKER, FRANK C., Chicago Acad. Sciences, Chicago, Ill.....	1907
BAKER, JOHN H., 7 Holyoke Place, Cambridge, Mass.....	1911
BALDWIN, ROGER N., 3739 Windsor Place, St. Louis, Mo.....	1904
BALES, Dr. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, Mrs. BENNET F., Oakville, Conn.....	1905
BALL, Miss HELEN AUGUSTA, 43 Laurel St., Worcester, Mass.....	1893
BALL, JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BANKS, Miss MARTHA, Westport, Conn.....	1911
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARBOUR, Dr. THOMAS, Mus. of Comp. Zoölogy, Cambridge, Mass.....	1903
BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C.....	1886
BARNES, CLAUDE T., Box 1199, Salt Lake City, Utah.....	1908
BARNES, Hon. R. MAGOON, Lacon, Ill.....	1889
BARRETT, CHAS. H. M., 5 Taylor St., Medford, Mass.....	1912

BARRETT, HAROLD LAWRENCE, 704 Centre St., Jamaica Plain, Mass.	1909
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.	1907
BARTLETT, Miss MARY F., 227 Commonwealth Ave., Boston, Mass.	1912
BATTEN, GEORGE, 381 Fourth Ave., New York City	1911
BAYNARD, OSCAR E., Box 328, Clearwater, Fla.	1910
BAYNES, ERNEST H., Meriden, N. H.	1912
BECK, ROLLO HOWARD, San José, R. D. 21, Cal.	1894
BEERS, HENRY W., 91 Denver Ave., Bridgeport, Conn.	1895
BELL, Prof. W. B., Agri. College, N. D.	1912
BENNETTS, WILLIAM J., 1941 1st St. N. W., Washington, D. C.	1901
BERGTOLD, Dr. W. H., 1159 Race St., Denver, Colo.	1889
BERIER, DE LAGNEL, 171 Monte Vista Place, Ridgwood, N. J.	1885
BERRY, Mrs. S. JENNIE, 633 Waterloo St., London, Ontario	1909
BETTS, NORMAN DE WITT, Forest Products Lab., Madison, Wis.	1908
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.	1898
BIGELOW, ALBERT F., 84 State St., Boston, Mass.	1910
BIGELOW, HENRY BRYANT, Concord, Mass.	1897
BIGELOW, HOMER LANE, Old Orchard Road, Chestnut Hill, Mass.	1902
BIGNELL, Mrs. EFFIE, 135 College Ave., New Brunswick, N. J.	1911
BIRDSEYE, CLARENCE, Biological Survey, Washington, D. C.	1908
BLACKWELDER, ELIOT, Univ. of Wisconsin, Madison, Wis.	1895
BLAIN, Dr. ALEX. W., Jr., 1105 Jefferson Ave., E., Detroit, Mich.	1901
BLAIN, MERRILL W., 1026 N. Coronado St., Los Angeles, Cal.	1910
BLAKE, SIDNEY F., 154 Walnut St., Stoughton, Mass.	1910
BLATCHLEY, W. S., 1530 Park Ave., Indianapolis, Ind.	1895
BLOOD, ROLAN H., Pepperell, Mass.	1912
BLOOMFIELD, Mrs. C. C., 723 Main St., W., Jackson, Mich.	1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.	1906
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.	1909
BOGERT, WILLIAM S., Leonia, N. J.	1904
BOLLES, Mrs. FRANK, 6 Berkeley St., Cambridge, Mass.	1912
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo.	1909
BOND, HARRY L., Lakefield, Minn.	1908
BONFILS, F. G., 1003 Corona St., Denver, Colo.	1912
BOOTH, SHERMAN M., Glen Cove, Ill.	1911
BORDEN, STENCER, Fall River, Mass.	1912
BORLAND, WM. G., 14 Wall St., New York City	1911
BORNEMAN, HENRY S., 1613 Dyre St., Frankford, Philadelphia, Pa.	1912
BOSSON, CAMPBELL, 722 Tremont Bldg., Boston, Mass.	1906
BOUDINOT, Mrs. H. R., 302 Rusholme St., Davenport, Iowa	1909
BOWDISH, B. S., Demarest, N. J.	1891
BOWDISH, Mrs. B. S., Demarest, N. J.	1902
BOWDITCH, HAROLD, 636 Beacon St., Boston, Mass.	1900
BOYD, Mrs. HARRIET, 17 Marsh St., Dedham, Mass.	1912
BOYNTON, CHAS. T., 1005 South Sheridan Rd., Highland Park, Ill.	1912
BRACKEN, Mrs. HENRY MARTYN, 1010 Fourth St., S. E., Minneapolis, Minn.	1897

BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass.....	1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....	1902
BRANDRETH, COURTENAY, Ossining, N. Y.....	1905
BRANDRETH, FRANKLIN, Ossining, N. Y.....	1889
BRANTLEY, WILLIAM FOREACRE, Blackshear, Ga.....	1912
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.....	1893
BREWSTER, MRS. WILLIAM, 145 Brattle St., Cambridge, Mass.....	1912
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
BRIDGE, MRS. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIGHT, MISS ANNA L., Pottsville, Pa.....	1903
BRIMLEY, H. H., Raleigh, N. C.....	1904
BRISTOL, JOHN I. D., 45 West 74th St., New York City.....	1907
BROCK, DR. HENRY HERBERT, 687 Congress St., Portland, Me.....	1894
BROCKWAY, ARTHUR W., Hadlyme, Conn.....	1912
BROOKS, REV. EARLE AMOS, 419 N. River Ave., Weston, W. Va.....	1892
BROOKS, GORHAM, 92 Beacon St., Boston, Mass.....	1912
BROOKS, WINTHROP S., Milton, Mass.....	1907
BROWN, MISS ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, ARTHUR L., 119 Park St., West Roxbury, Mass.....	1908
BROWN, C. EMERSON, 44 Sudbury St., Boston, Mass.....	1908
BROWN, EDWARD J., U. S. Nat. Museum, Washington, D. C.....	1891
BROWN, FRANK A., 1 Water St., Beverly, Mass.....	1912
BROWN, H. A., 40 Talbot St., Lowell, Mass.....	1912
BROWN, MRS. HENRY T., Winchester, Mass.....	1912
BROWN, HUBERT H., Beamsville, Ontario.....	1889
BROWN, PHILLIP G., 85 Vaughan St., Portland, Me.....	1911
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.....	1895
BROWN, WM. JAMES, 250 Olive Ave., Westmount, Quebec.....	1908
BROWNING, WM. HALL, 16 Cooper Square, New York City.....	1911
BRUEN, FRANK, 65 Prospect St., Bristol, Conn.....	1908
BUBIER, GEO. M., 185 Franklin St., Lynn, Mass.....	1911
BURBANK, CHAS. O., 48 Glenwood Ave., Newton Centre, Mass.....	1912
BURCKES, MRS. J. W., 36 Curve St., Waltham, Mass.....	1912
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....	1898
BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....	1901
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....	1895
BURNHAM, JOHN BIRD, 111 Broadway, New York City.....	1912
BURT, H. P., 355 Union St., New Bedford, Mass.....	1908
BURTCH, VERDI, Branchport, N. Y.....	1903
BUTLER, JEFFERSON, 121 W. Philadelphia Ave., Detroit, Mich.....	1912
BUXBAUM, MRS. CLARA E., 4822 Grand Boulevard, Chicago, Ill.....	1895
CABOT, LOUIS, Brookline, Mass.....	1904
CADUC, EUGENE E., 563 Massachusetts Ave., Boston, Mass.....	1910
CALLENDER, JAMES PHILLIPS, 32 Broadway, N. Y.....	1903
CALVERT, J. FLETCHER, Collegiate Inst., London, Ont.....	1912
CARPENTER, REV. CHARLES KNAPP, 311 Park St., Elgin, Ill.....	1894

CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.	1907
CARTER, JOHN D., Lansdowne, Pa.	1907
CASE, CLIFFORD M., 7 Holcomb St., Hartford, Conn.	1892
CASH, HARRY A., 54 Spring St., Pawtucket, R. I.	1898
CASKEY, ROBERT C., 58 Mills St., Morristown, N. J.	1908
CATLIN, JAMES P., Ottawa, Ill.	1905
CHAMBERLAIN, CHAUNCEY W., 36 Lincoln St., Boston, Mass.	1885
CHAMBERS, W. LEE, Eagle Rock, Cal.	1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass.	1896
CHAPIN, JAMES, 330 W. 95th St., New York City	1906
CHAPMAN, Mrs. F. M., Englewood, N. J.	1908
CHAPMAN, ROY, 507 15th Ave., S. E., Minneapolis, Minn.	1911
CHASE, SIDNEY, Nantucket, Mass.	1904
CHEESMAN, M. R., 55 W. 4th St., S., Salt Lake City, Utah	1911
CHENEY, Rev. ROBT. F., St. Mark's Rectory, Southboro, Mass.	1912
CHIPMAN, GRACE E., Sandwich, Mass.	1912
CHRISTIE, EDWARD H., 5069 Kensington Ave., St. Louis, Mo.	1910
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.	1901
CLARK, Mrs. ANNE M. L., Box 153, Lancaster, Mass.	1912
CLARK, B. PRESTON, Box 2862, Boston, Mass.	1907
CLARK, EDWARD B., Hamilton Hotel, Washington, D. C.	1900
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.	1895
CLARKE, CHARLES E., 11 Chetwynd Road, Tufts College, Mass.	1907
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.	1896
CLARKE, ROWENA A., Kirkwood Branch, St. Louis Mo.	1906
CLARKE, Dr. WM. C., 981 Madison Ave., New York City	1909
CLAY, CHAS. IRVIN, Box 353, Eureka, Cal.	1911
CLEAVES, HOWARD H., Public Museum, New Brighton, N. Y.	1907
CLEVELAND, Dr. CLEMENT, 925 Park Ave., New York City	1903
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass.	1906
COALE, HENRY K., Highland Park, Ill.	1883
COBB, Miss ANNIE W., 301 Massachusetts Ave., Arlington, Mass.	1909
COBB, STANLEY, 340 Adams St., Milton, Mass.	1909
CODMAN, JOHN S., Quail St., West Roxbury, Mass.	1908
COFFIN, Miss LUCY V. BAXTER, 3232 Groveland Ave., Chicago, Ill.	1905
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Cal.	1891
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis.	1908
COLVIN, WALTER S., Osawatomie, Kan.	1896
COMEY, ARTHUR C., 424 E. 13th St., Chester, Pa.	1902
COMMONS, Mrs. F. W., 2437 Park Ave., Minneapolis, Minn.	1902
CONEY, Mrs. GEO. H., 859 Prospect Ave., Hartford, Conn.	1906
COOK, Miss LILIAN GILLETTE, 165 W. 82d St., New York City	1899
COPE, FRANCIS R., Jr., Dimock, Pa.	1892
COPELAND, Dr. ERNEST, 141 Wisconsin St., Milwaukee, Wis.	1897
COPELAND, MANTON, 88 Federal St., Brunswick, Me.	1900
COREY, Miss ALICE F., 1111 Park Ave., Plainfield, N. J.	1910

COULTER, STANLEY, Lafayette, Ind.....	1912
CRAFT, Miss LAURA F., Glen Cove, N. Y.....	1912
CRAIG, WALLACE, Opono, Me.....	1912
CRAIGMILE, Miss ESTHER A., 24 S. Grant St., Hinsdale, Ill.....	1910
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANE, Miss CLARA L., Dalton, Mass.....	1904
CRANE, Mrs. ZENAS, Dalton, Mass.....	1904
CRESSY, Mrs. N. S., 25 Quaker Lane, West Hartford, Conn.....	1912
CROCKER, Mrs. DAVID, Barnstable, Mass.....	1912
CROCKER, Mrs. EMMONS, 48 Mechanics St., Fitchburg, Mass.....	1912
CROSBY, MAUNSELL S., Grasmere, Rhinebeck, N. Y.....	1904
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CURRIE, ROLLA P., Dept. of Agriculture, Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., St. Johns, Ore.....	1894
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.....	1910
CUTLER, Mrs. ANNIE F., 117 Washington Ave., Chelsea, Mass.....	1908
DANA, Miss ADA, 488 Centre St., Newton, Mass.....	1912
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....	1912
DANIELSON, Miss EDNA H., R. F. D. 3, Goodhue, Minn.....	1910
DART, Dr. LESLIE O., Curtis Court, Minneapolis, Minn.....	1898
DAVENPORT, Mrs. ELIZABETH B., Lindenhurst, Brattleboro, Vt.....	1898
DAVIDSON, Mrs. F. S., 1302 W., S. Grand Ave., Springfield, Ill.....	1912
DAVIS, CHARLES H., 515 Michigan Ave., Saginaw, Mich.....	1906
DAY, CHESTER SESSIONS, 15 Chilton Road, West Roxbury, Mass.....	1897
DAY, FRANK MILES, Mt. Airy, Philadelphia, Pa.....	1901
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DELOACH, R. J. H., University of Ga., Athens, Ga.....	1910
DENNIS, DAVID W., Richmond, Ind.....	1907
DENSMORE, Miss MABEL, 629 4th St., Red Wing, Minn.....	1910
DERBY, RICHARD, 969 Park Ave., New York City.....	1898
DERBY, W. M., Jr., 4857 Kimbark Ave., Chicago, Ill.....	1908
DERICKSON, Mrs. GEO. P., 1760 Hennepin Ave., Minneapolis, Minn.....	1910
DEVINE, J. L., 5319 Woodlawn Ave., Chicago, Ill.....	1903
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEWING, THOMAS W., 82 E. 55th St., New York City.....	1907
DICE, LEE RAYMOND, Prescott, Wash.....	1909
DICKERSON, Miss MARY C., Am. Mus. Nat. History, N. Y. City.....	1908
DICKEY, DONALD R., Box 701, Pasadena, Cal.....	1907
DICKEY, SAMUEL S., State College, Pa.....	1905
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIMOCK, GEO. E., Jr., 907 N. Broad St., Elizabeth, N. J.....	1911
DIONNE, C. E., Laval University, Quebec, Que.....	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....	1891
DODGE, CHARLES W., Univ. of Rochester, Rochester, N. Y.....	1900
DODSON, JOSEPH H., 534 Sheridan Road, Evanston, Ill.....	1909

DOLBEAR, KATHERINE, Clarke University, Worcester, Mass.....	1912
DORN, Prof. L., Concordia College, Fort Wayne, Ind.....	1912
DOUGHERTY, Gen. WILLIAM E., 1409 E. 14th St., Fruitvale, Cal.....	1890
DRAPER, J. SUMNER, Readville, Mass.....	1908
DROWNE, Dr. FREDERICK PEABODY, Warren, R. I.....	1899
DRUMMOND, Miss MARY, Spring Lane, Lake Forest, Ill.....	1904
DuBOIS, ALEX. DAWES, 327 S. Glenwood Ave., Springfield, Ill.....	1905
DU BON, JAMES L., Windsor Locks, Conn.....	1909
DUDLEY, SARAH H., Lyman School, Lowell, Mass.....	1912
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....	1899
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, W. LINFRED, Union Metallic Cartridge Co., Bridgeport, Conn.....	1906
DUNN, Miss HARRIET A., Box 45, Athol, Mass.....	1909
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DWIGHT, Dr. EDWIN W., 119 Pearl St., Boston, Mass.....	1911
DYCHE, Prof. L. L., Pratt, Kansas.....	1886
DYER, EDWARD T., Southampton, N. Y.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EARLE, Miss ELEANOR P., Palma Sola, Fla.....	1910
EARLY, CHAS. H., 185 Fairmount Ave., Hyde Park, Mass.....	1912
EASTMAN, FRANCIS B., Plattsburg Barracks, N. Y.....	1909
EASTMAN, HARRY D., 24 State St., Framingham, Mass.....	1891
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, North Bend, Ohio.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EDWARDS, PHOEBE P., Brookline, Mass.....	1912
EDWARDS, VINAL N., Box 36, Woods Hole, Mass.....	1912
EHINGER, Dr. CLYDE E., 100 Rosedale Ave., West Chester, Pa.....	1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, Addison, Ill.....	1901
EIMBECK, Dr. A. F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, care of G. Ekblaw, Rantoul, Ill.....	1911
ELDRIDGE, ARTHUR S., South Lincoln, Mass.....	1912
ELLIOT, Mrs. J. W., 124 Beacon St., Boston, Mass.....	1912
ELLIOTT, Dr. E. EARL, 63 William St., Lyons, N. Y.....	1912
ELLS, GEORGE P., Norwalk, Conn.....	1904
ELROD, Prof. MORTON J., 205 S. 5th St., Missoula, Montana.....	1892
EMMET, CHRISTOPHER TEMPLE, Stony Brook, N. Y.....	1909
EMMET, ROBERT T., New Rochelle, N. Y.....	1904
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va.....	1899
ENDERS, JOHN O., Box 546, Hartford, Conn.....	1904
EVANS, Miss NEVADA, 3637 10th Ave., S., Minneapolis, Minn.....	1910
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....	1897
FARLEY, JOHN A., 105 Summer St., Malden, Mass.....	1904

FARR, MARCUS S., Princeton University, Princeton, N. J.	1900
FARWELL, MRS. JOHN V., Ardleigh, Lake Forest, Ill.	1896
FAY, S. PRESCOTT, 3 Brimmer St., Boston, Mass.	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., West Philadelphia, Pa.	1903
FELTON, W. R., Box 414, Miles City, Mont.	1910
FERGUSON, MRS. MARY VAN E., 57 Arlington Ave., Providence, R. I.	1912
FERRY, Miss MARY B., 19 Morgan Ave., Norwalk, Conn.	1912
FIELD, EDWARD B., 30 Gillette St., Hartford, Conn.	1898
FIELD, Dr. GEO. W., Sharon, Mass.	1910
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.	1896
FISHER, G. CLYDE, Johns Hopkins Univ., Baltimore, Md.	1908
FISHER, WALTER T., 45 Fairfax St., Cambridge, Mass.	1907
FITTS, MRS. CAROLINE S., 29 Lakeville Place, Jamaica Plain, Mass.	1906
FLANAGAN, JOHN H., 10 Weybosset St., Providence, R. I.	1898
FLETCHER, MRS. MARY E., Proctorsville, Vt.	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.	1897
FORBES, ALEXANDER, Milton, Mass.	1912
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.	1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.	1883
FRANCIS, GEO. A., 1453 Sea View Ave., Bridgeport, Conn.	1911
FRASER, DONALD, Johnstown, N. Y.	1902
FRAZIER, J. F., Audubon, Iowa.	1909
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.	1903
FRENCH, CHARLES H., Canton, Mass.	1904
FRENCH, MRS. CHAS. H., Canton, Mass.	1908
FULLER, CLARENCE T., 71 Broadway, New York City.	1907
FULLER, Mrs. ELLA M., Needham, Mass.	1909
FULLER, T. OTIS, Needham, Mass.	1904
GABRIELSON, IRA N., 201 N. 3rd St., Marshalltown, Iowa.	1912
GANO, Miss LAURA, 744 National Road, W., Richmond, Ind.	1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.	1903
GARRICK, JAMES P., Jr., Weston, S. C.	1906
GATH, JOHN, Box 234, Torrington, Conn.	1901
GERTKEN, SEVERIN, St. Johns University, Collegeville, Minn.	1912
GIANINI, CHAS. A., Poland, N. Y.	1911
GIBSON, JOHN T., Southborough, Mass.	1912
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.	1904
GILMAN, M. FRENCH, Sacaton, Arizona.	1907
GLADDING, MRS. JOHN R., 30 Stimson Ave., Providence, R. I.	1912
GLEASON, ALFRED D., Gleasondale, Mass.	1912
GODSHALL, W. V., Center Hall, Pa.	1912
GOLSAN, LEWIS S., Autaugaville, Ala.	1912
GOODALE, Dr. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.	1885

GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill.....	1904
GORDON, HARRY E., 313 Laburnum Ave., Rochester, N. Y.....	1911
GOULD, Dr. ALFRED M., Malden, Mass.....	1912
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.....	1889
GRAHAM, WM. J., Aledo, Ill.....	1909
GRANGER, Miss HELEN, Wilder Hall, Amherst, Mass.....	1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City.....	1891
GRANT, WM. W., Englewood, N. J.....	1910
GRAVES, MRS. CHARLES B., 66 Franklin St., New London, Conn.....	1905
GRAY, Miss ISA E., 5 Chestnut St., Boston, Mass.....	1912
GREENE, CAROLINE S., 32 Linnaean St., Cambridge, Mass.....	1912
GREEN, Miss MARY AMORY, Croton-on-Hudson, N. Y.....	1911
GREENOUGH, HENRY VOSE, 23 Monmouth Court, Brookline, Mass.....	1909
GREGORY, STEPHEN S., Jr., 1349 Astor St., Chicago, Ill.....	1906
GRISCOM, LUDLOW, 21 Washington Sq., N., New York City.....	1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C.....	1909
GROSS, ALFRED O., 17 McKeen St., Brunswick, Me.....	1907
GUILD, HENRY R., 102 Beacon St., Boston, Mass.....	1912
GUTSELL, JAMES S., 301 College Ave., Ithaca, N. Y.....	1911
HADLEY, ALDEN H., Monrovia, Indiana.....	1906
HALES, HENRY, Ridgewood, N. J.....	1890
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y.....	1910
HALL, H. PORTER, Leominster, Mass.....	1904
HALLETT, GEO. H., Jr., Haverford College, Haverford, Pa.....	1911
HAMILTON, Dr. B. A., Highland Park, Ill.....	1909
HANKINSON, THOS. LEROY, Charleston, Ill.....	1897
HARDON, MRS. HENRY W., 315 West 71st St., New York City.....	1905
HARDY, JOHN H., Jr., Littleton, Mass.....	1905
HARPER, FRANCIS, 555 First Ave., College Point, N. Y.....	1907
HARPER, Mrs. GEO. V., 102 Pennsylvania Ave., Wilmington, Del.....	1910
HARRIS, HARRY, Kansas City, Mo.....	1911
HARRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1911
HART, CHARLES G., Box 47, East Berlin, Conn.....	1908
HARVEY, Miss RUTH SAWYER, 1203 Woodland Ave., Cincinnati, Ohio.....	1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill.....	1905
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....	1897
HAVEMEYER, H. O., Jr., Mahwah, N. J.....	1893
HAZARD, Hon. R. G., Peace Dale, R. I.....	1885
HEIL, CHARLES E., Needham, Mass.....	1908
HELME, ARTHUR H., Miller Place, N. Y.....	1888
HEMENWAY, MRS. HARRIET L., Readville, Mass.....	1912
HENDERSON, ALEXANDER, Woodlawn Rd., Chestnut Hill, Mass.....	1912
HENDERSON, Judge JUNIUS, Boulder, Colo.....	1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....	1885
HENN, ARTHUR WILBUR, Indiana University, Bloomington, Ind.....	1909
HERRICK, HAROLD, 25 Liberty St., New York City.....	1905

HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass.....	1911
HERSEY, L. J., 2121 W. 34th Ave., Denver, Colo.....	1909
HESS, ISAAC E., Philo, Ill.....	1909
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HIGGINS, HENRY CHAS., Uxbridge, Mass.....	1912
HILL, JAMES HAYNES, 202 Broad St., New London, Conn.....	1897
HILL, MRS. THOMAS R., Box 491, Chautauqua, N. Y.....	1903
HILL, WILLIAM H., 83 Marvin St., Brookline, Mass.....	1912
HINCKLEY, GEO. LYMAN, Public Library, Boston, Mass.....	1912
HINCKLEY, HENRY H., Melrose Highlands, Mass.....	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....	1899
HINE, MRS. JANE L., Auburn, Ind.....	1890
HITCHCOCK, FRANK H., Metropolitan Club, Washington, D. C.....	1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....	1899
HOLDEN, MRS. EDWIN B., 323 Riverside Drive, New York City.....	1903
HOLDEN, MRS. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLLAND, HAROLD MAY, Galesburg, Ill.....	1910
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, WARREN D., 620 McPhea Bld'g., Denver, Colo.....	1901
HOLMAN, RALPH H., 50 Congress St., Boston.....	1907
HOLT, ERNEST G., Barachias, Ala.....	1911
HOLT, MRS. NANCY W. C., 13 Chauncey St., Cambridge, Mass.....	1908
HONYWILL, ALBERT W., Jr., 522 Holmes St., Wilkesburg, Pa.....	1907
HORSFALL, BRUCE, Princeton, N. J.....	1905
HOTCHKISS, Miss JULIA R., 502 W. 113 St., New York City.....	1912
HOWE, FLORENCE A., Box 334, Indianapolis, Ind.....	1912
HOWE, CARLTON D., Morrisville, Vt.....	1901
HOWE, REGINALD HEBER, Jr., Thoreau Museum, Concord, Mass....	1895
HOWELL, A. BRAZIER, Covina, Cal.....	1909
HOWELL, BENJ. F., Jr., R. F. D. 1, Boonton, N. J.....	1907
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....	1912
HOYT, Miss ANNIE S., 121 Madison Ave., New York City.....	1909
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, Dr. LUCIUS L., Houghton, Mich.....	1907
HUBBARD, MRS. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUDSON, MRS. K. W., 33 Trowbridge St., Cambridge, Mass.....	1911
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....	1895
HUNT, CHRESWELL J., 740 S. Cuyler Ave., Oak Park, Ill.....	1902
HUTCHINSON, Dr. W. F., Box 42, Portsmouth, Va.....	1910
HVOSLEF, J. C., Lanesboro, Minn.....	1912
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., Box 843, San Diego, Cal.....	1885
IRVING, JOHN, Glen Cove, N. Y.....	1894
ISHAM, C. B., 27 W. 67 St., New York City.....	1891
IVES, H. DAVID, Southampton, N. Y.....	1912

JACKSON, HARTLEY H. T., Biological Survey, Washington, D. C.....	1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....	1888
JAMES, MRS. I. M., 105 W. Court St., Doylestown, Pa.....	1909
JENKINS, MISS IDA G., 30 Dearborne St., Roxbury, Mass.....	1912
JENKS, CHAS. W., Bedford, Mass.....	1912
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....	1905
JENSEN, J. K., Westwood, Mass.....	1912
JESSUP, J. M., Smithsonian Institution, Washington, D. C.....	1910
JEWEL, LINDSEY L., Box 303, Colon, Panama.....	1910
JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon.....	1906
JEWETT, McCORMICK, 395 Yale Station, New Haven, Conn.....	1909
JOHNS, ERWIN WM., Kingsley, Iowa.....	1910
JOHNSON, CHAS. E., 714 16 Ave., S. E., Minneapolis, Minn.....	1912
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y.....	1888
JOHNSON, MRS. GRACE PETTIS, City Library Asso., Springfield, Mass.	1908
JOHNSON, JAMES HOWARD, Bradford, N. H.....	1894
JOHNSON, WALTER ADAMS, 120 W. 32d St., New York City.....	1889
JOHNSON, WILLIAM S., Lyons, N. Y.....	1893
JOHNSTON, J. W., 5 Arnold Park, Rochester, N. Y.....	1911
JONES, F. W., 448 Broadway, Somerville, Mass.....	1912
JONES, DR. LOMBARD C., Falmouth, Mass.....	1912
JORDAN, A. H. B., Everett, Wash.....	1888
JUMP, MRS. EDWIN R., 350 Waltham St., West Newton, Mass.....	1910
KALMBACH, EDWIN R., Biological Survey, Washington, D. C.....	1910
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KEIM, THOMAS DANIEL, Fellowship Farm, Stelton, N. J.....	1902
KENDALL, H. F., Virginia, Minn.....	1911
KENDRICK, WILLIAM F., Denver, Colo.....	1912
KENISTON, ALLAN, Box 148, Edgartown, Mass.....	1912
KENT, EDWIN C., 90 West St., New York City.....	1907
KERMODE, FRANCIS, Provincial Museum, Victoria, B. C.....	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
*KIDDER, NATHANIEL T., Milton, Mass.....	1906
KILBURN, FRANK M., Fort Fairfield, Me.....	1911
KILGORE, WILLIAM, Jr., 4304 Colfax Ave., S., Minneapolis, Minn.....	1906
KILMAN, A. H., Ridgeway, Ontario.....	1909
KING, LE ROY, 20 E. 84th St., New York City.....	1901
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.....	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....	1910
KIRKWOOD, FRANK C., Baldwin, Md.....	1892
KITTREDGE, JOSEPH, Jr., 69 Cypress St., Brookline, Mass.....	1910
KLOSEMAN, MISS JESSIE E., 4 Spruce St., Dedham, Mass.....	1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.....	1907

* Life Associate.

KNOLHOFF, FERDINAND WILLIAM, Bloomfield, N. J.	1890
KOHLER, LOUIS SLIDELL, 98 Watsessing Ave., Bloomfield, N. J.	1910
KREMER, ROLAND EDWARD, 1720 Vilas St., Madison, Wis.	1909
KUSER, ANTHONY R., Bernardsville, N. J.	1908
KUSER, MRS. ANTHONY R., Bernardsville, N. J.	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.	1910
KUTCHIN, DR. VICTOR, Green Lake, Wis.	1905
LACEY, HOWARD GEORGE, Kerrville, Texas.	1899
LAMB, CHAS. R., 159 Brattle St., Cambridge, Mass.	1912
LANCASHIRE, MRS. JAMES HENRY, Alma, Mich.	1909
LANE, LAWTON W., 121 Franklin St., Lynn, Mass.	1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.	1907
LANTZ, PROF. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.	1885
LARRABEE, AUSTIN P., 1540 Vassar Ave., Wichita, Kan.	1902
LATIMER, MISS CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa.	1902
LAW, J. EUGENE, Hollywood, Cal.	1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City.	1907
LEE, HENRY E., Rapid City, S. D.	1910
LEMAN, J. HOWARD, 48 Beacon St., Boston, Mass.	1912
LEMSEN, NICHOLAS F., 34 Nassau St., New York City.	1912
LENGERKE, JUSTUS VON, 200 5th Ave., New York City.	1907
LEVEY, W. CHARLESWORTH, Alton Bay, N. H.	1908
LEWIS, DR. FREDERIC T., 76 Oxford St., Cambridge, Mass.	1909
LEWIS, HARRISON F., R. R. 2 Yarmouth, Nova Scotia.	1912
LEWIS, MRS. HERMAN, 120 Grove St., Haverhill, Mass.	1912
LINCOLN, FREDERICK CHARLES, 3350 Shoshone St., Denver, Colo.	1910
LINSAY, DR. D. MOORE, 808 Boston Block, Salt Lake City, Utah.	1912
LINTON, CLARENCE B., 125 West Ocean Ave., Long Beach, Cal.	1908
LINZEE, JOHN W., 96 Charles St., Boston, Mass.	1912
LORD, REV. WILLIAM R., Dover, Mass.	1901
LORING, J. ALDEN, Owego, N. Y.	1889
LOW, ETHELBERT T., 30 Broad St., New York City.	1907
LUCE, MRS. FRANCES P., 140 Washington St., Boston, Mass.	1912
LUM, EDWARD H., Chatham, N. J.	1904
LUTHER, CLARENCE H., 8 McIlroy Bldg., Fayetteville, Ark.	1910
MACDOUGALL, GEORGE R., 112 Wall St., New York City.	1890
MACKIE, DR. WM. C., 54 Coolidge St., Brookline, Mass.	1908
MACLAY, MARK W., JR., 830 Park Ave., New York City.	1905
MADDOCK, MISS EMELINE, The Drexel, Philadelphia, Pa.	1897
MADISON, HAROLD L., Park Museum, Providence, R. I.	1912
MAHER, J. E., Windsor Locks, Conn.	1902
MAITLAND, ROBERT L., 141 Broadway, New York City.	1889
MANN, ELIAS P., Williamstown, Mass.	1912
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass.	1907
MARCH, PROF. JOHN LEWIS, Union College, Schenectady, N. Y.	1903

MARRS, Mrs. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.	1903
MARSDEN, H. W., Witch Creek, Cal.	1904
MARSHALL, ELLA, M. O., New Salem, Mass.	1912
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.	1902
MARTIN, GEO. C., Box 332, Asbury Park, N. J.	1912
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa.	1907
MATTERN, EDWIN S., 105 South 4th St., Allentown, Pa.	1912
MATTERN, WALTER, 105 South 4th St., Allentown, Pa.	1912
MAULE, GEO. C., Gum Tree, Pa.	1910
MAY, Miss ADELINA, 226 Ocean St., Lynn, Mass.	1912
MAYNARD, C. J., 447 Crafts St., West Newton, Mass.	1912
McCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.	1900
McCONNELL, HARRY B., Cadiz, O.	1904
McCook, PHILIP JAMES, 15 William St., New York City	1895
McHATTON, Dr. HENRY, 335 Golley St., Macon, Ga.	1898
McLHENNY, EDWARD AVERY, Avery Island, La.	1894
McINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass.	1908
McLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va.	1893
McMILLAN, Mrs. GILBERT, Gorham, N. H.	1902
MEAD, Mrs. E. M., 301 W. 91 St., New York City	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.	1912
MELLUS, J. T., 36 Cottage St., Wellesley, Mass.	1912
MERRIAM, CHARLES, Weston, Mass.	1908
MERRIAM, HENRY F., 30 Clinton Ave., Maplewood, N. J.	1905
MERRILL, ALBERT R., Hamilton, Mass.	1912
MERRILL, HARRY, Bangor, Maine	1883
MERSHON, W. B., Saginaw, Mich.	1905
MESSENGER, G. H., Linden, Iowa	1911
METCALF, ROBT. W., 160 High St., Springfield, Mass.	1912
METCALF, WILLARD L., 33 West 67th St., New York City	1908
MILLER, CHAS. W., Shawnee-on-Delaware, Pa.	1909
MILLER, LEO., Amer. Museum Nat. Hist., New York City	1912
MILLS, HARRY C., Box 218, Unionville, Conn.	1897
MILLS, HERBERT R., Tampa, Fla.	1911
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.	1900
MITCHELL, CATHERINE ADAMS, Riverside, Ill.	1911
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan.	1893
MOIR, ALEX. L., 77 Hampshire St., Lowell, Mass.	1912
MOORE, HENRY D., Haddonfield, N. J.	1911
MOORE, Miss ELIZ. PUTNAM, New Jersey State Hospital, Trenton, N. J.	1905
MOORE, ROBERT THOMAS, 46 Mansion Ave., Haddonfield, N. J.	1898
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J.	1910
MORCOM, G. FREAN, 734 Belden Ave., Chicago, Ill.	1886
MORE, R. L., Vernon, Texas	1911
MORGAN, ALBERT, Box 1323, Hartford, Conn.	1903
MORLEY, G. GRISWOLD, 2325 13th St., Boulder, Colo.	1911

MORRIS, SIDNEY V., Bristol, Pa.....	1911
MORSE, HARRY GILMAN, Huron, Ohio.....	1912
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass.....	1905
MOSSMAN, Miss MARY, 1616 Blue Hill Ave., Boston, Mass.....	1912
MURPHEY, Dr. EUGENE E., 444 Tellfair St., Augusta, Ga.....	1903
MURPHY, ROBERT C., 224 Angell St., Providence, R. I.....	1905
MUSGRAVE, JOHN K., 3516 Shady Ave., Allegheny, Pa.....	1909
MUSSELMAN, THOMAS EDGAR, Gem City Business College, Quincy, Ill.....	1910
MYERS, Mrs. HARRIET W., 311 Ave. 66, Los Angeles, Cal.....	1906
MYERS, Miss LUCY F., Brookside, Poughkeepsie, N. Y.....	1898
NASH, HERMAN W., Box 264, Pueblo, Colo.....	1892
NELSON, JAMES ALLEN, Bureau of Entomology, Washington, D. C.....	1898
NEWELL, Mrs. H. S., 2431 E. 5th St., Duluth, Minn.....	1912
NEWHALL, DANIEL S., Strafford, Pa.....	1908
NEWMAN, Rev. STEPHEN M., Howard University, Washington, D. C.....	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.....	1890
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York City.....	1901
NICHOLSON, DONALD J., W. Church St., Orlando, Fla.....	1912
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.....	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich.....	1909
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.....	1897
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OLDYS, HENRY, Silver Springs, Md.....	1896
*OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.....	1900
OSBORN, ARTHUR A., 58 Washington St., Peabody, Mass.....	1912
OSBURN, PINGREE S., 189 E. Colorado St., Pasadena, Cal.....	1910
OVERTON, Dr. FRANK, Patchogue, N. Y.....	1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PACKER, JESSE E., Norwood Station, Pa.....	1910
PAINÉ, AUGUSTUS G., Jr., 18 West 49th St., New York City.....	1886
PALADIN, ARTHUR, N. Y. State Museum, Albany, N. Y.....	1911
PALMER, S. C., Swarthmore College, Swarthmore, Pa.....	1912
PARKER, Mrs. BENJAMIN W., 4 Hopestill St., Dorchester Centre, Mass.....	1909
PARKER, Hon. HERBERT, South Lancaster, Mass.....	1904
PARSONS, JOHN E., Lenox, Mass.....	1912
PARSONS, R. L., 158 Raymond Ave., South Orange, N. J.....	1911
PARSONS, WILLIAM, Box 422, Manila, P. I.....	1909
PAUL, LUCIUS H., 202 Edinburgh St., Rochester, N. Y.....	1908
PEABODY, Rev. P. B., Blue Rapids, Kan.....	1903
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa.....	1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.....	1903
PECK, MORTON E., 292 N. Summer St., Salem, Ore.....	1909

* Life Associate.

PECK, WALTER M., 15 9th St., East Providence, R. I.....	1909
PENARD, THOS. E., 16 Norfolk Rd., Arlington, Mass.....	1912
PENFIELD, Miss ANNIE S., 155 Charles St., Boston, Mass.....	1912
PENNINGTON, FRED ALBERT, 5529 Monroe Ave., Chicago, Ill.....	1910
PEPPER, Dr. WM., 1811 Spruce St., Philadelphia, Pa.....	1911
PERKINS, Dr. GEO. H., Burlington, Vt.....	1912
PERRY, HENRY JOSEPH, 636 Beacon St., Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908
PETERS, JAMES LEE, Harvard, Mass.....	1904
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHILIPP, PHILIP B., 220 Broadway, New York City.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 4 West Weir St., Taunton, Mass.....	1912
PIERREPONT, JOHN JAY, 1 Pierrepont Place, Brooklyn, N. Y.....	1911
PILSBURY, FRANK O., Box 592, Walpole, Mass.....	1909
PINCHOT, GIFFORD, 1617 Rhode Island Ave., Washington, D. C.....	1910
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....	1906
POE, Miss MARGARETTA, 1222 N. Charles St., Baltimore, Md.....	1899
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POND, Miss ELLEN J., 160 Lexington, Ave., New York City.....	1909
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Del.....	1901
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....	1908
PORTER, Rev. E. C., 51 Fowler St., Boston, Mass.....	1912
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, WM. S., 347 5th Ave, New York City.....	1911
POTTER, JULIAN K., Camden, N. J.....	1912
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PRIMM, ROY LEE, 113 W. Dayton St., Madison, Wis.....	1912
PROCTOR, MRS. HENRY H., 282 Commonwealth Ave., Boston, Mass.....	1912
PROCTOR, THOS. E., Topsfield, Mass.....	1912
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....	1893
PUTNAM, Prof. F. W., Cambridge, Mass.....	1912
RABORG, WM. A., Jr., Muirkirk, Md.....	1909
RATHBORNE, R. C., Bernardsville, N. J.....	1911
RAMSDEN, CHAS. G., Box 146, Guantanamo, Cuba.....	1912
RAWSON, CHAS. T., Oxford, Mass.....	1912
RAWSON, CALVIN LUTHER, R. F. D. 2, Putnam, Conn.....	1885
RAYMOND, Mrs. C. E., 21 3d St., Hinesdale, Ill.....	1910
REA, PAUL M., Charleston Museum, Charleston, S. C.....	1912
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REDFIELD, ALFRED C., 56 Plympton St., Cambridge, Mass.....	1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass.....	1897
REECHER, SAMUEL E., Chester, Ill.....	1912
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....	1900

REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REYNOLDS, THEO. E. W., R. F. D. 2, Kent, Wash.....	1912
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.....	1895
RICE, JAMES HENRY, Jr., Summerville, S. C.....	1910
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass.....	1900
RICHARDSON, WYMAN, 224 Beacon St., Boston, Mass.....	1912
RIDEOUT, A. LILLIAN, 15 Farragut Rd., Swampscott, Mass.....	1912
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., 43 Scotland Rd., South Orange, N. J.....	1885
RING, CLARK L., Saginaw, Mich.....	1912
RIPLEY, CHAS., 173 Harvard St., Dorchester, Mass.....	1912
RIPLEY, Mrs. J. W., 112 Cedar St., Malden, Mass.....	1912
ROBBINS, Miss ALMEDA B., Y. M. Library Association, Ware, Mass.....	1910
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....	1906
ROBERTS, WILLIAM ELY, 5501 Spruce St., Philadelphia, Pa.....	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Cal.....	1911
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
ROBINSON, LEWIS W., Cresskill, N. J.....	1910
ROBINSON, Dr. PHILIP E., 102 Huntington Ave., Boston, Mass.....	1908
ROCKWOOD, Mrs. GEO. I., 340 May St., Worcester, Mass.....	1912
*ROGERS, CHARLES H., Amer. Mus. Nat. Hist., New York City.....	1904
ROLFE, ALFRED G., High School, Pottstown, Pa.....	1909
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROPER, KENYON, 509 N. 4th St., Steubenville, Ohio.....	1911
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROSS, Dr. LUCRETIVS, 507 Main St., Bennington, Vt.....	1912
ROSSIGNOL, GILBERT R., Jr., 2116 Bull St., Savannah, Ga.....	1909
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....	1889
SACKETT, CLARENCE, Rye, N. Y.....	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SALLEY, FITZHUGH, Charleston Museum, Charleston, S. C.....	1907
SANBORN, COLIN C., 709 E. Lincoln Ave., Highland Park, Ill.....	1911
SANFORD, HARRISON, Litchfield, Conn.....	1905
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C.....	1906
SAUNDERS, ARETAS A., Chateau, Mont.....	1907
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....	1895
SAVAGE, WALTER GILES, Delight, Ark.....	1898
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill.....	1907
SCHENCK, FREDRIC, 52 Brattle St., Cambridge, Mass.....	1912
SCHMIDT, WALDO, U. S. S. S. "Albatross," Sausalito, Cal.....	1910
SCHWEDER, ARTHUR, 184 Upper Mountain Ave., Montclair, N. J.....	1911
SEWALL, JOTHAM B., 1501 Beacon St., Brookline, Mass.....	1912
SHANNON, WM. PURDY, 1170 Broadway, New York City.....	1908
SHARPLES, ROBERT P., West Chester, Pa.....	1907

* Life Associate.

SHAW, CHAS. F., 676 Bedford St., North Abington, Mass.	1912
SHAW, Dr. J. HOLBROOK, 43 Court St., Plymouth, Mass.	1912
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash.	1908
SHEARER, AMON R., Mont Belvieu, Tex.	1905
SHELDON, CHARLES, 140 W. 57th St., New York City	1911
SHELTON, ALFRED, 2237 Dwight Way, Berkeley, Cal.	1911
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C.	1907
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.	1910
SHOEMAKER, FRANK H., 206 Nebraska Hall, Station A, Lincoln, Neb.	1895
SHOEMAKER, HENRY W., 26 W. 53 St., New York City	1912
SHORE, EDWIN W., 191 Campbell St., New Bedford, Mass.	1909
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.	1899
SILLIMAN, HARPER, 4 Gramercy Park, New York City	1902
SIMMONS, GEO. F., Stewart Bldg., Houston, Texas	1910
SLADE, Mrs. DANIEL D., Chestnut Hill, Mass.	1912
SMITH, AUSTIN PAUL, Falfurrias, Texas	1911
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.	1906
SMITH, Miss ETHEL M., Rome, Ohio	1910
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.	1903
SMITH, Prof. FRANK, Univ. of Ill., Urbana, Ill.	1909
SMITH, HORACE G., State Capitol, Denver, Colo.	1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.	1886
SMITH, JESSE L., 141 South 2nd St., Highland Park, Ill.	1907
SMITH, LOUIS IRVIN, Jr., 3908 Chestnut St., Philadelphia, Pa.	1901
SMITH, MYRTON T., 308 Pearl St., Hartford, Conn.	1909
SMITH, WILBUR F., South Norwalk, Conn.	1909
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va.	1892
SNYDER, WILL EDWIN, R. F. D. 6, Beaver Dam, Wis.	1895
SPAULDING, FRED B., Lancaster, N. H.	1894
SPELMAN, HENRY M., 48 Brewster St., Cambridge Mass.	1911
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.	1883
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.	1909
STEELE, JOHN H., Flemington, N. J.	1906
STEPHENS, T. C., Morningside College, Sioux City, Iowa	1909
STEVENS, FRANK E., 25 Hudson St., Somerville, Mass.	1912
STEVENS, Dr. J. F., Box 546, Lincoln, Neb.	1908
STILES, EDGAR C., 345 Main St., West Haven, Conn.	1907
ST. JOHN, EDWARD PORTER, 1566 Broad St., Hartford, Conn.	1911
STOCKBRIDGE, CHAS. A., Fort Wayne, Ind.	1911
STODDARD, HERBERT LEE, 218 25th St., Milwaukee, Wis.	1912
STONE, CLARENCE F., Branchport, N. Y.	1903
STONE, WM. D., Fayetteville, Ark.	1911
STOVER, ALLAN J., Kings Rd., R. F. D. 3, Corvallis, Ore.	1912
STRATER, FRANCIS A., 50 Sumner Rd., Brookline, Mass.	1912
STRATER, Mrs. WM. E., 1114 3d. Ave., Louisville, Ky.	1910
STRATTON-PORTER, Mrs. GENE, Box 855, Geneva, Ind.	1906

STREET, J. FLETCHER, Beverly, N. J.....	1908
STRODE, W. S., LEWISTON. Ill.....	1911
STURGIS, S. WARREN, 152 Brattle St., Cambridge, Mass.....	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
STYER, MRS. KATHARINE R., Concordville, Pa.....	1903
SUMMERS, JOHN N., 17 E. Highland Ave., Melrose Highlands, Mass.....	1912
SUMNER, MRS. GRAHAM, Englewood, N. J.....	1910
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa.....	1897
SWAIN, JOHN MERTON, Box 633, Farmington, Me.....	1899
SWEET, EDMUND H., Sturgis, S. D.....	1910
SWENK, MYRON H., 3028 Start Street, Lincoln, Neb.....	1904
SWEZEY, GEORGE, 855 S. 15th St., Newark, N. J.....	1901
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....	1907
TAYLOR, B. F., 1619 Green St., Columbia, S. C.....	1911
TERRILL, LEWIS Mcl., Stanley Ave., St. Lambert, Quebec.....	1907
TEST, CHARLES DARWIN, Golden, Col.....	1906
TEST, Dr. FREDERICK CLEVELAND, 4620 Greenwood Ave., Chicago, Ill.....	1892
TEST, LOUIS AGASSIZ, Rolla, Mo.....	1908
THOMAS, Miss EMILY HINDS, 2000 Spruce St., Philadelphia, Pa.....	1901
THOMPSON, CHAS. S., 1721 Mission St., South Pasadena, Cal.....	1909
THORNE, SAMUEL, 19 Cedar St., New York City.....	1908
THURSTON, HENRY, Box 181, Floral Park, N. Y.....	1912
TILLEY, GEO. D., Darien, Conn.....	1910
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....	1907
TOMLINSON, FRANKLIN L., Box 572, Shelton, Conn.....	1912
TOPPAN, GEORGE L., care of Col. C. Pfaff, Framingham, Mass.....	1886
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.....	1908
TOWNSEND, WILMOT, 334 80th St., Brooklyn, N. Y.....	1894
TREGANZA, A. O., 610 Utah Savings & Trust Bldg., Salt Lake City, Utah.....	1906
TRIPPE, THOMAS M., Howardsville, Colo.....	1909
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRUMBULL, J. H., Plainville, Conn.....	1907
TUDBURY, WARREN C., 8 Mall St., Salem, Mass.....	1903
TUFTS, LE ROY MELVILLE, Thrushwood, Farmington, Me.....	1903
TUFTS, Miss MARY I., 1 Atlantic St., Lynn, Mass.....	1910
TUTTLE, Dr. ALBERT H., 1069 Boylston St., Boston, Mass.....	1908
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....	1890
TUTTLE, HENRY EMERSON, 253 Yale Station, New Haven, Conn.....	1909
TWEEDY, EDGAR, 37 Fairview Ave., Danbury, Conn.....	1902
TYLER, JOHN G., 1114 Belmont Ave., Fresno, Cal.....	1912
TYLER, Dr. WINSOR M., 522 Mass. Ave., Lexington, Mass.....	1912
ULRICH, ALBERT GEORGE, 3307 Washington Ave., St. Louis, Mo.....	1909
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....	1900

VALENTINE, Miss ANNA J., Bellefonte, Pa.....	1905
VAN BEUREN, Miss LOUISE, 21 W. 14th St., New York City.....	1909
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD GIBBS, N. Y. State Museum, Albany, N. Y....	1900
VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....	1907
VETTER, Dr. CHARLES, 2 West 88th St., New York City.....	1898
VIETOR, Dr. ED. W., 166 St. James Place, Brooklyn, N. Y.....	1911
VISHER, STEPHEN S., Vermilion, S. D.....	1904
VOTEY, Prof. J. WM., 489 Main St., Burlington, Vt.....	1912
VROOMAN, ISAAC H., Jr., 282 Hamilton St., Albany, N. Y.....	1908
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn....	1906
WAITE, Miss ELIZABETH W., 29 Shepard St., Cambridge, Mass....	1912
WAITE, Mrs. J. GILMAN, 19 Pearl St., Medford, Mass.....	1912
WALES, EDWARD H., Hyde Park, N. Y.....	1896
WALES, Miss ELLA S., 186 Columbia Road, Dorchester, Mass.....	1908
WALKER, CURTIS H., University of Chicago, Chicago, Ill.....	1910
WALKER, ERNEST P., Laramie, Wyo.....	1911
WALKER, GEO. R., R. F. D. 3, Murray, Utah.....	1909
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLACE, JAMES S., 533 Front St., E., Toronto, Ontario.....	1907
WALTER, Dr. HERBERT E., 53 Arlington Ave., Providence, R. I....	1901
WALTERS, FRANK, South Sandisfield, Mass.....	1902
WARD, FRANK HAWLEY, 18 Grove Place, Rochester, N. Y.....	1908
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....	1906
WARD, Mrs. MARTHA E., 25 Arlington St., Lynn, Mass.....	1909
WARNER, EDWARD P., Concord, Mass.....	1910
WARNER, GOODWIN, Concord Junction, Mass.....	1908
WEBER, J. A., Palisades Park, N. J.....	1907
WEBBER, Mrs. W. G., Box F., Bedford, Mass.....	1912
WEIR, J. ALDEN, 471 Park Ave., New York City.....	1899
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.....	1908
WELLS, CHAS. S., Elwyn, Pa.....	1911
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., Matchuala, S. L. P., Mexico.....	1900
WETMORE, Mrs. EDMUND, 125 E. 57th St., New York City.....	1902
WEYGANDT, CORNELIUS, Wissahickon Ave., Mt. Airy, Philadelphia, Pa.	1907
WHARTON, WILLIAM P., Groton, Mass.....	1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn....	1898
WHEELER, HARVEY, Elm St., Concord, Mass.....	1912
WHELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITCOMB, MYRON L., 40 Westland Terrace, Haverhill, Mass.....	1912
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario.....	1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....	1902
WHITE, W. C., CHESTER, S. C.....	1911

WHITNEY, Prof. DAVID D., Wesleyan Univ., Middletown, Conn.....	1912
WICKERSHAM, CORNELIUS W., Cedarhurst, N. Y.....	1902
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 162 W. 54th St., New York City.....	1895
WILDE, MARK L. C., 311 N. 5th St., Camden, N. J.....	1893
WILLARD, BERTEL G., 30 Huntington Ave., Boston, Mass.....	1906
WILLARD, FRANK C., Tombstone, Arizona.....	1909
WILLET, GEORGE, 2123 Court St., Los Angeles, Cal.....	1912
WILLIAMS, HARRY C., 4919 Maple Ave., St. Louis, Mo.....	1908
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City.....	1888
WILLIAMS, ROBERT W., Jr., Tallahassee, Fla.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLISTON, Mrs. SAMUEL, 577 Belmont St., Belmont, Mass.....	1911
WINDLE, FRANCIS, 253 Dean St., West Chester, Pa.....	1909
WINSLOW, ARTHUR M., 3 Lyford St., Worcester, Mass.....	1912
WITHERBEE, Mrs. F. B., 106 Berkeley St., West Newton, Mass.....	1906
WOOD, Mrs. GEO., 1313 Spruce St., Philadelphia, Pa.....	1910
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C.....	1895
WOODRUFF, FRANK M., 225 Wisconsin St., Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 24 Broad St., New York City.....	1886
WORCESTER, Mrs. ALFRED, Bacon St., Waltham, Mass.....	1908
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889
WRIGHT, ALBERT H., 707 E. State St., Ithaca, N. Y.....	1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.....	1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass.....	1902
WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal.....	1907
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
WYMAN, LUTHER E., R. F. D. 3, Nampa, Idaho.....	1907
YOUNG, Miss HARRIET FIBLE, Maple & Monroe Sts., Hinsdale, Ill.....	1911
YOUNG, JOHN A., 371 Dundas St., London, Ontario.....	1907
YOUNG, JNO. P., 1510 5th Ave., Youngstown, Ohio.....	1911
ZAPPEY, WALTER R., 137 Westminster Ave., Arlington Heights, Mass.....	1905
ZIMMER, J. T., 421 Holdridge St., Lincoln, Neb.....	1908

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death</i>
ALDRICH, CHARLES.....	March 8, 1908
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE CHARLES EMIL.....	Feb. 4, 1897
COUES, ELLIOTT.....	Dec. 25, 1899
GOSS, NATHANIEL STICKNEY.....	March 10, 1891
HOLDER, JOSEPH BASSETT.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES CUSHING.....	Oct. 27, 1902
PURDIE, HENRY AUGUSTUS.....	March 29, 1911
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN MAYNARD.....	Jan. 28, 1887

HONORARY FELLOWS.

BLANFORD, WILLIAM THOMAS.....	June 23, 1905
BOCAGE, J. V. BARBOZA DU.....	July —, 1908
BURMEISTER, HERMANN.....	May 1, 1892
CABANIS, JEAN.....	Feb. 20, 1906
GÄTKE, HEINRICH.....	Jan. 1, 1897
GIGLIOLI, HENRY HILLYER.....	Dec. 14, 1909
GUNDLACH, JUAN.....	March 14, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, GUSTAV.....	Nov. 20, 1900
HUXLEY, THOMAS HENRY.....	June 29, 1890
KRAUS, FERDINAND.....	Sept. 15, 1895
LAWRENCE, GEORGE NEWBOLD.....	Jan. 17, 1895
MEYER, ADOLF BERNARD.....	Feb. 5, 1911
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900
NEWTON, ALFRED.....	June 7, 1907
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SAUNDERS, HOWARD.....	Oct. 20, 1907
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SEEBOHM, HENRY.....	Nov. 26, 1895
SHARPE, RICHARD BOWDLER.....	Dec. 25, 1909
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.	Jan. 1, 1900
ANDERSON, JOHN	Aug. 16, 1900
BALDAMUS, EDUARD	Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT	Oct. 15, 1891
BLASIUS, RUDOLPH	Sept. 21, 1907
BLASIUS, WILHELM	May 31, 1912
BOGDANOW, MODEST NIKOLAEVICH	March 4, 1888
BRYANT, WALTER E.	May 21, 1905
BULLER, WALTER LAWRY	July 19, 1906
COLLETT, ROBERT	Jan. 27, 1913
COOPER, JAMES GRAHAM	July 19, 1902
CORDEAUX, JOHN	Aug. 1, 1899
DAVID, ARMAND	Nov. 10, 1900
DUGÈS, ALFRED	Jan. 7, 1910
FATIO, VICTOR	March 19, 1906
HAAST, JULIUS VON	Aug. 15, 1887
HARGITT, EDWARD	March 19, 1895
HAYEK, GUSTAV EDLER VON	Jan. 9, 1911
HOLUB, EMIL	Feb. 21, 1902
HOMER, EUGEN FERDINAND VON	May 31, 1889
KNUDSON, VALDEMAR	Jan. 8, 1898
LAYARD, EDGAR LEOPOLD	Jan. 1, 1900
LEVERKÜHN, PAUL	Dec. 5, 1905
LYTTLETON, THOMAS LORD LILFORD	June 17, 1896
MARSCHALL, AUGUST FRIEDRICH	Oct. 11, 1887
MALMGREN, ANDERS JOHAN	April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON	Jan. 28, 1894
MOSJISOVICS, FELIX G. HERMANN AUGUST	Aug. 27, 1897
OATES, EUGENE WILLIAM	Nov. 16, 1911
OUSTALET, EMILE	Oct. 23, 1905
PHILIPPI, RUDOLPH AMANDUS	Aug. —, 1904
PREJEVALSKI, NICOLAS MICHAELOVICH	Oct. 20, 1887
PRENTISS, DANIEL WEBSTER	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN	Feb. 17, 1888
RADDE, GUSTAV FERDINAND	— 1903
SCHRENCK, LEOPOLD VON	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE	Dec. 11, 1900
SEVERTZOW, NICOLAI ALEKSYEVICH	Feb. 8, 1885
SHELLEY, GEORGE ERNEST	Nov. 29, 1910
STEVENSON, HENRY	Aug. 18, 1888
TRISTRAM, H. B.	March 8, 1906
WHARTON, HENRY T.	Sept. —, 1895
WOODHOUSE, SAMUEL W.	Oct. 23, 1904

MEMBERS.

FANNIN, JOHN.....	June 20, 1904
HARDY, MANLY.....	Dec. 9, 1910
JUDD, SYLVESTER DWIGHT.....	Oct. 22, 1905
RALPH, WILLIAM LeGRANGE.....	July 8, 1907
TORREY, BRADFORD.....	Oct. 7, 1912
WHITMAN, CHARLES OTIS.....	Dec. 6, 1910

ASSOCIATES.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ANTES, FRANK T.....	Feb. 6, 1907
ATKINS, HARMON ALBRO.....	May 19, 1885
AVERY, WILLIAM CUSHMAN.....	March 11, 1894
BAILEY, CHARLES E.....	—, 1905
BARLOW, CHESTER.....	Nov. 6, 1902
BAUR, GEORGE.....	June 25, 1898
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BILL, CHARLES.....	April —, 1897
BIRTWELL, FRANCIS JOSEPH.....	June 29, 1901
BOARDMAN, GEORGE AUGUSTUS.....	Jan. 11, 1901
BOLLES, FRANK.....	Jan. 10, 1894
BRACKETT, FOSTER H.....	Jan. 5, 1900
BREESE, WILLIAM LAWRENCE.....	Dec. 7, 1889
BRENINGER, GEORGE FRANK.....	Dec. 3, 1905
BRENNAN, CHARLES F.....	Mar. 21, 1907
BROKAW, LOUIS W.....	Sept. 3, 1897
BROWN, JOHN CLIFFORD.....	Jan. 16, 1901
BROWNE, FRANCIS CHARLES.....	Jan. 9, 1900
BROWNSON, W. H.....	Sept. 6, 1909
BURNETT, LEONARD E.....	March 16, 1904
CAIRNS, JOHN S.....	June 10, 1895
CALL, AUBREY BRENDON.....	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL.....	April —, 1897
CANFIELD, J. B.....	Feb. 18, 1904
CARLETON, CYRUS.....	Nov. 15, 1907
CARTER, EDWIN.....	— 1900
CARTER, ISABEL PADDOCK.....	Sept. 15, 1907
CHADBOURNE, MRS. ARTHUR PATTERSON.....	Oct. 4, 1908
CHARLES, FRED LEMAR.....	May 6, 1911
CLARK, JOHN NATHANIEL.....	Jan. 13, 1903
COE, W. W.....	April 26, 1885

COLBURN, WILLIAM W.....	Oct. 17, 1899
COLLETT, ALONSO M.....	Aug. 22, 1902
CONANT, MRS. THOS. O.....	Dec. 28, 1907
CORNING, ERASTUS, JR.....	April 9, 1893
DAFFIN, WM. H.....	April 21, 1902
DAKIN, JOHN ALLEN.....	Feb. 21, 1900
DAVIS, MRS. SUSAN L.....	Feb. 13, 1913
DAVIS, WALTER R.....	April 8, 1907
DEXTER, NEWTON.....	July 27, 1901
DODGE, JULIAN MONTGOMERY.....	Nov. 23, 1909
ELLIOTT, SAMUEL LOWELL.....	Feb. 11, 1889
FAIRBANKS, FRANKLIN.....	April 24, 1895
FARWELL, MRS. ELLEN S.....	Aug. 6, 1912
FERRY, JOHN FARWELL.....	Feb. 11, 1910
FISHER WM. HUBBELL.....	Oct. 6, 1909
FOWLER, JOSHUA LOUNSBURY.....	July 11, 1899
FULLER, CHARLES ANTHONY.....	Mar. 16, 1906
GESNER, ABRAHAM HERBERT.....	April 30, 1895
GOSS, BENJAMIN FRANKLIN.....	July 6, 1893
HATCH, JESSE MAURICE.....	May 1, 1898
HODLEY, FREDERICK HODGES.....	Feb. 26, 1895
HOLMES, LARUE KLINGLE.....	May 10, 1906
HOOPES, JOSIAH.....	Jan. 16, 1904
HOWE, MISS LOUISE.....	Sept. 13, 1912
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON.....	Oct. 2, 1898
JENKS, JOHN WHIPPLE POTTER.....	Sept. 27, 1894
JESURUN, MORTIMER.....	March —, 1905
JOUY, PIERRE LOUIS.....	March 22, 1894
KELKER, WM. A.....	Feb. 15, 1908
KNIGHT, WILBUR CLINTON.....	July 8, 1903
KNOX, JOHN C.....	July 9, 1904
KNOX, JOHN COWING.....	June 1, 1904
KOCH, AUGUST.....	Feb. 15, 1907
KUMLIEN, LUDWIG.....	Dec. 4, 1902
KUMLIEN, THURE.....	Aug. 5, 1888
LAWRENCE, ROBERT HOE.....	April 27, 1897
LEE, LESLIE ALEXANDER.....	May 20, 1908
LINDEN, CHARLES.....	Feb. 3, 1888
LLOYD, ANDREW JAMES.....	June 14, 1906
MABBETT, GIDEON.....	Aug. 15, 1900
MAITLAND, ALEXANDER.....	Oct. 25, 1907
MARBLE, CHARLES C.....	Sept. 25, 1900
MARCY, OLIVER.....	March 19, 1899
MARIS, WILLARD LORRAINE.....	Dec. 11, 1895
MC EWEN, DANIEL C.....	Nov. 1, 1909

McKINLAY, JAMES.....	Nov. 1, 1899
MEAD, GEORGE SMITH.....	June 19, 1901
MINOT, HENRY DAVIS.....	Nov. 13, 1890
MORRELL, CLARENCE HENRY.....	July 15, 1902
NICHOLS, HOWARD GARDNER.....	June 23, 1896
NIMS, LEE.....	March 12, 1903
NORTHROP, JOHN I.....	June 26, 1891
PADDOCK, ISABEL M.....	Sept. 15, 1907
PARK, AUSTIN F.....	Sept. 22, 1893
PAULMIER, FREDERICK CLARK.....	March 3, 1906
POMROY, GRACE V.....	May 14, 1906
RAGSDALE, GEORGE HENRY.....	March 25, 1895
READY, GEORGE H.....	March 20, 1903
RAWLE, FRANCIS WILLIAM.....	June 12, 1911
REED, CHESTER A.....	Dec. 15, 1912
RICHARDSON, JENNESS.....	June 24, 1893
ROBINS, MRS. EDWARD.....	July 2, 1906
SAND, ISABELLA LOW.....	April 20, 1906
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES H.....	Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR ALBERT.....	April 24, 1884
SMALL, H. W.....	Mar. 12, 1912
SMITH, CLARENCE ALBERT.....	May 6, 1896
SMITH, MRS. RUTH C.....	Jan. 1, 1912
SNOW, FRANCIS HUNTINGTON.....	Sept. 20, 1908
SOUTHWICK, JAMES MORTIMER.....	June 3, 1904
STOWE, W. H.....	March —, 1895
SWEIGER, MRS. J. L.....	March 23, 1907
TAYLOR, ALEX. O'DRISCOLL.....	April 10, 1910
THOMPSON, MILLET T.....	Aug. 7, 1907
THORNE, PLATTE MARVIN.....	March 16, 1897
THURBER, EUGENE CARLETON.....	Sept. 6, 1896
UPHAM, MRS. WILLIAM H.....	Nov. 29, 1912
VENNOR, HENRY GEORGE.....	June 8, 1884
WATERS, EDWARD STANLEY.....	Dec. 26, 1902
WILLARD, SAMUEL WELLS.....	May 24, 1887
WILSON, SIDNEY.....	Nov. 22, 1911
WISTER, WILLIAM ROTCH.....	Aug. 21, 1911
WOOD, WILLIAM.....	Aug. 9, 1885
WOODRUFF, EDWARD SEYMOUR.....	Jan. 15, 1909
WORTHEN, CHARLES K.....	May 27, 1909
YOUNG, CURTIS CLAY.....	July 30, 1902



1. LOW SAND BANKS ABOUT FIVE MILES FROM THE MOUTH OF THE NATASHQUAN RIVER SHOWING SPRUCE AND FIR FOREST.



2. ON THE BRINK OF THE THIRD FALLS; A PIECE OF THE FOURTH FALLS CAN BE SEEN IN THE DISTANCE.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXX.

JANUARY, 1913.

No. 1.

SOME MORE LABRADOR NOTES.

BY CHARLES W. TOWNSEND, M. D.¹

Plates I-II.

THE following notes on the birds of the Labrador Peninsula are the result of a canoe trip some eighty miles up the Natashquan river and ten or fifteen miles up a subsidiary stream, and of the steamer journey to and from the mouth of the river. Owing to the almost continuous stormy weather during the four weeks of the trip, conditions for bird observation were unsatisfactory. In addition the start was made later than I had intended and the song season was nearly over.

Leaving Quebec on July 20, 1912, I reached Natashquan on July 25 and started up the great river the next day with a companion and two French fishermen. The Natashquan River empties into the Gulf of St. Lawrence about half way between the base of the peninsula and the Straits of Belle Isle. On August 1 a point was reached about eighty miles up the river, some sixty miles from the sea in a direct line. Returning about forty miles, a subsidiary stream on the west side was ascended ten or fifteen miles and three days were spent in exploring the small lakes and surrounding country. Returning to Natashquan, I caught the steamer on August 10 and reached Quebec on August 14.

In the paper by Mr. Bent and myself ² a description of this coastal strip of the Labrador Peninsula is given, as well as our reasons

¹ Read at the meeting of the American Ornithologists' Union, Nov. 12, 1912.

² Additional Notes on the Birds of Labrador. Auk, XXVII, 1910, pp. 1-18.

for believing that the high land which we visited where it approached the coast at Mingan was arctic in appearance only, and that it had been deforested by fire.

The valley of the Natashquan river as far as I went was densely forested with black spruce and balsam fir. White spruces and white birches were not uncommon while a few mountain ashes, larches, and aspens were also seen, and alders and low willows occurred in places on the river's edge. The forest trees were from 30 to 60 feet high but rarely attained a diameter of more than a foot. An exceptional white birch was 72 inches in circumference and a balsam fir, 64 inches. Their growth was very slow; for example, a balsam fir, which we cut for bedding, was $7\frac{3}{4}$ inches in diameter, 48 feet tall and showed 182 rings.

The river is over a mile wide at its mouth and flows between low sand banks for twelve miles. Above this rapids and falls abound in the granitic rock, and the surrounding hills increase in size as one ascends. Glacial gouges and scratches are everywhere plain; their average direction is south 12° east, in relation to true north. Marine cliffs of sand and clay over one hundred and fifty feet high are cut by the river some seventy-five miles from the sea. The whole region has undergone recent elevation by tilting following a previous submersion. At our farthest point inland many of the hills, 800 feet or more above the river, were wooded, while others were nearly destitute of trees. As at Mingan I found the charred stumps of trees on the high land showing that it was formerly forested.

Very few birds were seen along the coast — pitiful remnants of the great hosts that formerly bred there. Loons were common, Red-throated Loons uncommon. Of Puffins only two were seen off the Perroquets on the journey down and two on the return. One was seen near Piashte-bai. Black Guillemots were fairly common. Of Murres, either *troille* or *lomvia*, I saw four between Natashquan and Esquimaux Point, and fourteen between Mingan and Seven Islands. Of Razor-billed Auks I saw only two off the Perroquets on the trip down and three on the return, as well as two near Piashte-bai. A Dovekie was seen on July 21 above the region of the Labrador Peninsula near Godbout. Mr. Napoleon A. Comeau, the veteran naturalist of this place, told me that

a few Dovekies are generally to be found along the coast in summer. While these birds are called Bull-birds by the English-speaking inhabitants on the eastern coast, the French of the southern coast call them *Bons Hommes*.

Eight Parasitic Jaegers were seen off Long Point; several of these were in the dark phase. Kittiwakes in small numbers were seen along the coast especially in the region of the Perroquets; nearly all were in immature plumage. At the mouth of the Natashquan River four immature Glaucous Gulls consorted with Great Black-backed and Herring Gulls and both of these last named Gulls were common on the coast. Terns were common everywhere but not in large numbers. Those examined carefully with glasses seemed to be all Common Terns except one seen at close range at Natashquan that was an Arctic Tern.

One Petrel, probably a Wilson's Petrel, was seen off the Mingan Islands. No Gannets were to be seen about the Perroquets on our passage east, and but five on the return, three in adult, two in immature plumage. I was told that although a few of these birds visited the place every season, none had bred there for years. This corresponds with the results obtained here by Mr. Bent and myself in 1909. On August 10 the steamer passed near enough to a rocky island off Agwannus for me to see some fifty or sixty Double-crested Cormorants thereon. This was one of the three colonies visited by Mr. Bent and myself in 1909.

Of Ducks, a few Red-breasted Mergansers and one or two Whistlers were seen along the coast. Eiders were fairly common, but not abundant, east of Mingan. All were in the brown plumage, although an occasional male was seen with a few white feathers still remaining. The males are believed by many on the coast to disappear after the middle of July and this they can do effectually by dropping their conspicuous nuptial dress and donning the well named eclipse plumage. All three species of Scoters were seen in small numbers on the coast.

On and near the beach at Natashquan and about the Little Natashquan River, Semipalmated Sandpipers, Sanderlings, Greater Yellow-legs, Spotted Sandpipers, Hudsonian Curlews, Semipalmated and Piping Plovers and Ruddy Turnstones were found in small numbers. Of these the Hudsonian Curlews and Piping Plover

are worthy of note. Of the Hudsonian Curlew I saw 25 on the beach at Natashquan on July 25 and 12 flying about the barren hills near Natashquan village on August 8. They were all very wild. Curlew berries, mountain cranberries and bake-apples (cloud berries) were abundant there and the natives said that the Curlew fed on them. As recorded by Allen and myself in our 'Birds of Labrador'¹ Audubon stated that the Hudsonian Curlew was 'entirely unknown' on this coast, but Stearns in 1880 and '81, and Frazer in 1884, both found it not a rare migrant in the fall. Mr. Johan Beetz told Mr. Bent and myself in 1909 that *le courlis*,— by which he must have meant this species,— was increasing on the coast. This is interesting in connection with the apparent increase of the Hudsonian Curlew in Essex County, Mass.² in the last 60 years. No Eskimo Curlew were seen.

Mr. Bent and I found two Piping Plover on the beach at Natashquan on May 31, 1909. This was the first record of this species for the Labrador Peninsula. On July 25, 1912, I saw two adults and two fully grown young in a family group on this same beach.

So much for the water birds of this coast; their numbers are steadily diminishing for the eggs, nesting-birds and young are the prey not only of the Indians but of the fishermen all along the coast. It is to be hoped that adequate protection will be given them before it is too late.

In the trip up the Natashquan River the following birds were identified, and are worth recording as so little is known of the interior of Labrador. The small number of species and of individuals is partly to be accounted for by the lateness of the season and the unpropitious weather. A reason for the scarcity of ducks and other water-fowl is the fact that the river is one of the highways of migration of the Montagnais Indians. They descend it in the latter part of May with their packs of furs obtained in the interior. After disposing of the furs to the traders, attending to their religious festivities in the Catholic Mission, and feasting on sea birds' eggs and flesh they return up the river in August.

1. *Gavia immer*. LOON.—Two or three seen.

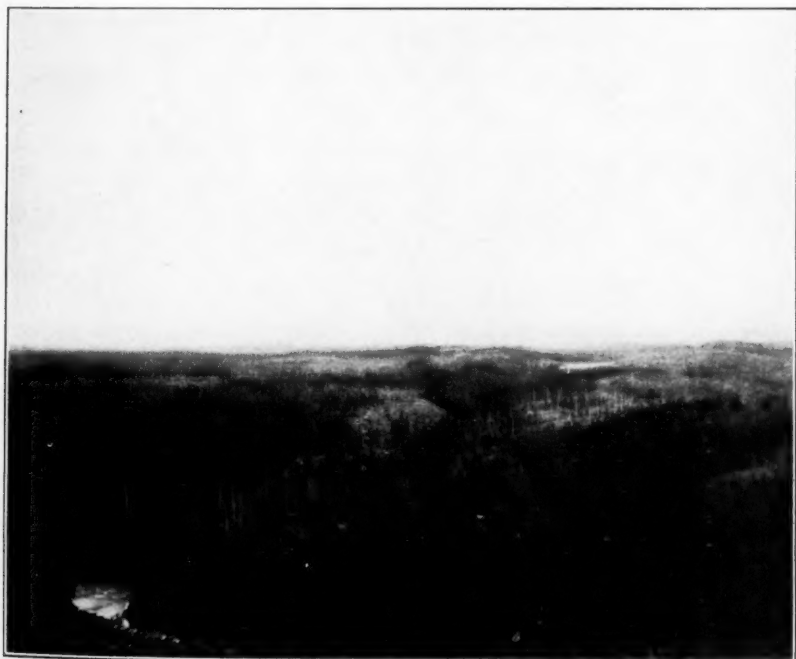
2. *Gavia stellata*. RED-THROATED LOON.—A few near the mouth of the river.

¹ Proc. Boston Soc. Nat. Hist., July, 1907.

² Birds of Essex County, p. 190.



1. THE NATASHQUAN RIVER ABOUT FIFTY MILES FROM THE MOUTH.



2. CHARACTER OF THE COUNTRY ABOUT FORTY MILES INLAND, AS SEEN FROM THE HILL FREQUENTED BY THE RED-TAILED HAWK.



3. **Larus marinus.** GREAT BLACK-BACKED GULL.—One was seen on July 26, ten miles from the mouth, and another on August 2, about fifty-five miles from the mouth of the river.

4. **Larus argentatus.** HERRING GULL.—A few of these birds all in adult plumage were seen both along the main river and the branch stream.

5. **Sterna hirundo.** COMMON TERN.—Among the sand bars below the first fall a few Common Terns were seen and five or six from twenty to forty miles up the river.

6. **Mergus serrator.** RED-BREASTED MERGANSER.—A single bird was seen flying over the rapids of the fifth fall, another some seventy-five miles up, and one on the branch river. This one in female plumage flew ahead of the canoe, croaking hoarsely.

7. **Anas rubripes tristis.** BLACK DUCK.—The only Black Ducks I saw were in the branch stream on August 5, about forty miles from the sea. Here I came upon six birds and shot one, an adult female. The others were probably young birds, but all took to their wings after acting at first as if unable to fly. The bird I secured had a pale olive-green bill with a black nail; pale dusky brown or straw-colored tarsi and feet, without any hint of red, a buffy almost immaculate throat and dark crown and nape. The bird was a typical *tristis*. The breast was very dark and beautifully streaked.

8. **Clangula clangula americana.** GOLDEN-EYE.—A young bird unable to fly with a little natal down still about its head was secured in the main river. No others were seen here. In the branch stream on August 3, I came upon a mother and four nearly fully fledged young still unable to fly. The old bird crouched low in the water — her golden eyes showing very prominently,—and uttered hoarse rasping croaks. The young, whose eyes were gray-blue and inconspicuous, at once scattered, diving repeatedly and disappeared in the bushes, while the mother kept prominently in view within twenty yards of the canoe leading us down stream. After repeatedly swimming and flying short distances ahead of the canoe for half a mile or so, croaking all the time, she disappeared around a bend and undoubtedly flew back to the young. Near at hand the young made no sound, but at a distance a loud beseeching peep was uttered.

9. **Branta canadensis canadensis.** CANADA GOOSE.—Seven nearly grown young birds were found in the branch stream. They were able to progress over the water with great speed by use of the legs aided by the partly developed wings. No adults were seen.

10. **Botaurus lentiginosus.** BITTERN.—A single bird of this species was seen and thoroughly identified on August 3 as it jumped into the air within a few yards of the canoe on the branch stream. This is an interesting record as the previous ones are so meagre. Coues found a wing in the possession of a hunter in southern Labrador and Bigelow speaks of seeing two or three at Cape Francis.

11. **Pisobia minutilla.** LEAST SANDPIPER.—One was seen above the fifth falls on July 30.

12. *Actitis macularia*. SPOTTED SANDPIPER.—Common on the borders of the rivers and lakes.

13. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—One seen flying south over the river on August 6.

14. *Bonasa umbellus togata*. CANADA RUFFED GROUSE.—A family with half grown young was seen at the third falls on July 27, and another on July 31 about 75 miles up the river.

15. *Circus hudsonius*. MARSH HAWK.—A pair of Marsh Hawks were found at the mouth of the Natashquan River, and another inland from the village. This pair probably had young as one of them was very noisy, repeating the whinnying notes and launching itself to within thirty yards of me in a threatening manner whenever I entered a certain bog. This was on August 8 and 9. With the exception of the record by Mr. Bent and myself in 1909, Audubon's and Stearns' records are the only previous ones for this species.

16. *Accipiter cooperi*. COOPER'S HAWK.—One was seen near the fourth falls on August 7 and another, or the same bird, on July 30. Stearns is the only one who has previously recorded this bird.

17. *Buteo borealis borealis*. RED-TAILED HAWK.—A very dark bird of this species was seen for three days near a precipitous hill on the branch river. Only when seen from above could the red tail be distinguished; from below, the tail seemed nearly black. The Labrador form of the Canada Jay is somewhat darker than the same species elsewhere. This tendency to dark plumage is particularly marked in the Labrador form of the Horned Owl. It is possible that the same may be true of the Red-tailed Hawk of Labrador, although the individual that I observed may have been merely an exceptional case of melanism. This same tendency to darker plumage is suggested in the Flicker and Yellow Warbler as referred to later in this paper. Beebe has shown that a damp climate in itself, aside from other environment, tends to darkness in plumage, and the climate of Labrador in summer is damp.

The piercing cry of this Hawk, well described by Chapman as suggestive of escaping steam, was continually emitted whenever we appeared in the neighborhood. No nest could be found although the bird's actions suggested young. The only previous records of the bird are as follows: Audubon says "a tail feather of the Red-tailed Hawk, young, was found [near Cape Whittle]; therefore that species exists here." Palmer records that "two were seen at the Mingan Islands."

18. *Archibuteo lagopus sancti-johannis*. ROUGH-LEGGED HAWK.—At the fifth falls on July 30 I saw one and another on July 31 near Devil's Mountain. As it flew towards the cliffs it was greeted by a chorus of shrill whistles. No nest, however, could be seen.

19. *Falco columbarius columbarius*. PIGEON HAWK.—One seen on July 26 about ten miles from the mouth of the river.

20. *Pandion haliaëtus carolinensis*. OSPREY.—One or two were

seen at the mouth of the river, one about forty miles up, and one on the branch stream.

21. **Bubo virginianus heterocnemis.** LABRADOR HORNE OWL.— On August 3, a cloudy day, a bird of this species flapped and sailed across the branch river and alighted on a spruce within easy range of the canoe. Here he sat looking straight at us with wide open eyes, and at the same time I twice heard the call of another Owl in the distance. The bird proved to be a male in the sooty plumage characteristic of this race. As far as I know there are no previous identifications of this species so far to the southwest in the Peninsula.

22. **Ceryle alcyon alcyon.** BELTED KINGFISHER.— Common on the main river and the branch stream. The nesting hole of one was seen in a sand bank.

23. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— One was seen near the small river on August 5 and again on August 6.

24. **Colaptes auratus luteus.** NORTHERN FLICKER.— A pair were seen several times near the branch river, and one was heard calling at the fifth falls. I was unable to secure a specimen. One sent me by Dr. Grenfell from Sandwich Bay in 1908 was somewhat darker than the usual New England specimens.

25. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— A pair were seen on several successive days about some dead trees on the little river. The only previous record for Labrador is the statement of Audubon that he "found this species . . . on the coast of Labrador."

26. **Empidonax flaviventris.** YELLOW-BELLIED FLYCATCHER.— The characteristic whistling note of this species was heard several times, and an individual came on board the steamer off the western point of the peninsula on August 12.

27. **Perisoreus canadensis nigricapillus.** LABRADOR JAY.— This bird was more often heard than seen, and was fairly common.

28. **Corvus brachyrhynchos brachyrhynchos.** CROW.— The only Crows seen were four on the shore of the Bay of Seven Islands. No Ravens were seen.

29. **Loxia curvirostra minor.** CROSSBILL.— A flock of about fifty was seen on July 27.

30. **Loxia leucoptera.** WHITE-WINGED CROSSBILL.— One seen on July 30, and another came on board the steamer on August 12. This was a young bird with bill still uncrossed.

31. **Passerculus sandwichensis savanna.** SAVANNAH SPARROW.— These birds were common in the sand dune country at the mouth of the Natashquan river but were not found inland.

32. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— One or two were seen or heard singing nearly every day near the rivers.

33. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— Common; found in the thick spruce woods feeding young.

34. *Melospiza lincolni lincolni*. LINCOLN'S SPARROW.—Several were seen along both rivers. Two pairs acted as if they had young.

35. *Passerella iliaca iliaca*. FOX SPARROW.—Common at the mouth of the river and one was heard singing about 75 miles up stream. As the song season had practically ceased I may have overlooked many of these as of other species.

36. *Iridoprocne bicolor*. TREE SWALLOW.—An occasional individual of this species was seen from time to time flying over the rivers, four in all, and one was seen about the steamer off the Mingan Islands.

37. *Vermivora peregrina*. TENNESSEE WARBLER.—None were seen in the interior but on August 13 two in juvenal plumage came on board the steamer in a fog not far from Godbout.

38. *Dendroica aestiva aestiva*. YELLOW WARBLER.—Two of this species were seen on July 31 and August 1 about seventy-five or eighty miles up the river and the female secured. This specimen as well as an adult male taken at Esquimaux Point by Mr. Bent on June 10, 1909, and a young bird from North West River sent me by Dr. Grenfell, taken September 1, 1905, all appear somewhat darker and to have slightly thicker bills than those taken farther south. The number of specimens, however, is too small to afford any conclusions of value.

39. *Dendroica coronata*. MYRTLE WARBLER.—Only two Myrtle Warblers were seen on the trip.

40. *Dendroica magnolia*. MAGNOLIA WARBLER.—A common warbler along the river courses and still in feeble song up to the end of the first week in August.

41. *Dendroica striata*. BLACK-POLL WARBLER.—Only one bird was identified inland, but at the mouth of the river several were heard singing feebly on August 8 and 9. Either the birds inland had migrated, or had finished rearing their young and were moulting, concealed and silent. The season inland is earlier than on the coast at Natashquan, which is the westernmost point of the Arctic Coastal Strip.

42. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—This was the commonest warbler inland, and was almost everywhere in evidence owing to the constant chipping of the young calling for food. The adults sang occasionally up to the last of July. Mr. Bent and I found this bird abundant on the southern coast in 1909, but previous to this time there had been but three records for the whole of Labrador, one taken at Esquimaux Point by Frazar, and two seen at the Mingan Islands by Palmer. The breeding of this bird in the same region with such Hudsonian species as the Lincoln's and Fox Sparrows and the Labrador Horned Owl is interesting and surprising. The Check-List states that it is a bird of the 'Lower Canadian and Transition Zones.'

43. *Setophaga ruticilla*. REDSTART.—Several were seen near the landing wharf for Clark City at the Bay of Seven Islands on July 23. They were in song.

44. **Sitta canadensis.** RED-BREASTED NUTHATCH.—None were seen on shore, but on August 11, off Moisie, five of this species, one adult, the others immature, came on board the steamer in a fog and remained on board two days. They were extremely tame and crept about the deck, and on the ropes and spars, sometimes within a few inches of the passengers. One alighted on the coat-collar of a sailor as he was lighting his pipe, and another on my shoulder as I stood on the bridge. I put my hand near the adult Nuthatch on the rail and he picked at my finger; then he flew into the captain's cabin and gathered insects from the window. There were many small dead moths on board that seemed to be particularly relished. I noticed two Nuthatches on the chains of the smoke stack undisturbed by the constant vibrations, and, what is still more surprising, by the deafening steam fog-horn that was blown at frequent intervals within a few feet of them.

45. **Penthestes atricapillus atricapillus.** CHICKADEE.—On an island at the fourth falls on July 28 I saw and clearly identified one of this species while I was watching a small band of Hudsonian Chickadees. The previous records for the Labrador Peninsula are few and unsatisfactory.

46. **Penthestes hudsonicus hudsonicus.** HUDSONIAN CHICKADEE.—Common inland.

47. **Regulus satrapa satrapa.** GOLDEN-CROWNED KINGLET.—One or two individuals only were seen.

48. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.—This bird, found so commonly in 1909, had evidently finished its nesting season and was rarely in evidence. On August 5, I heard a feeble attempt at song.

49. **Hylocichla guttata pallasi.** HERMIT THRUSH.—Common all along the courses of the rivers, but not in full song.

50. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.—Common and in partial song.

51. **Planesticus migratorius migratorius.** ROBIN.—Several were seen near the mouth of the Natashquan River, and two were seen near the small river about forty miles inland.

In all 74 species were seen on the coast and in the interior.

Additional Notes.

At Natashquan, Mr. Richard Joncas, the head of the Labrador Fur Company, to whom I am indebted for many kindnesses, has a mounted Pintail, *Dafla acuta*, shot at that place in 1911. This is the ninth record for Labrador.

I am able to give the first definite record of the Wood Duck, *Aix sponsa*, for the Labrador Peninsula, namely an adult male speci-

men caught in a muskrat-trap at Long Point on July 1, 1912, and brought to Robert Smith of Mingan, who presented it to M. Johan Beetz of Piashte-bai in whose collection it now is. This brings the number of species and subspecies for the Labrador Peninsula up to 219.

In letters to me from Dr. W. T. Grenfell under dates of October 4 and 17, and November 5, 1912, the following records are of interest:

A female Morning Dove, *Zenaidura macroura carolinensis*, found dead on the beach at Spotted Islands in August, and another seen alive at Battle Harbor on October 2, 1912. There are only two previous records for Labrador.

Seven Eskimo Curlew, *Numenius borealis*, shot and one other seen on the beach at West Bay north of Cartwright in August and September, 1912. The skins of five were saved and sent to Cambridge where they were seen and identified by Mr. Wm. Brewster.

This record of the Eskimo Curlew is of great interest for there has been no other authentic record since September 14, 1909, and the species was believed to be extinct. It was a great pity that the few survivors of this interesting species should be shot either for specimens or for food. I would suggest that the bird be put on the protected list at all times in the United States and Canada wherever it is possible to pass such a law, that all offers of money for specimens by collectors be at once withdrawn, and that Dr. Grenfell be asked to distribute notices along the Labrador Coast to the effect that no specimens will be paid for, and urging the inhabitants not to shoot any Curlew in order if possible to save the species from extinction.

NOTES ON THE PANAMA THRUSH-WARBLER.

BY HUBERT LYMAN CLARK.¹

THANKS to the kindness of Mr. Outram Bangs, I have recently had the opportunity of examining some fine alcoholic material of the Panama Thrush-Warbler, *Rhodinocichla rosea eximia* Ridgway. Mr. Bangs called my attention to the fact that the systematic position of this bird is still unsettled and he suggested that a study of some of the anatomical details of its structure might throw light on its relationships. For his kindness in placing the material in my hands, without restrictions, and for the loan of skins of several other genera which I wished to examine, I desire to express here my hearty thanks to Mr. Bangs.

I should be rash indeed if I expected to actually settle, by these notes, the systematic position of *Rhodinocichla* for like many another genus of Passerine birds, this one approaches more or less nearly several different families and with which one it is most closely affiliated is largely a matter of opinion. All I hope to do is to point out some features of the anatomy not previously known, summarize those which have been described, and express my own opinion as to the relationship which these facts seem to indicate.

Bill. The bill is rather slender, about 18 mm. long, 5 mm. wide at base and 8 mm. deep at the same point. The upper mandible is distinctly curved but the lower is remarkably straight. The tomia are entire with neither tooth nor notch, and the same is true of the edges of the upper mandible except near the tip, where there is a large, rounded notch. This notch is exactly like that which is found in the same position in the bill of certain tanagers, *Eucometis*, *Mitrospingus*, etc. Indeed, the bill of *Rhodinocichla* is more like that of *Mitrospingus* than like that of any other bird with which I have compared it.

Nostrils. The nostrils show no distinctive character. They are ellipsoidal, longer than high and quite bare; the skin back of

¹ Read at the meeting of the American Ornithologists' Union, November 13, 1912.

them is free from feathers for a couple of millimeters. There is no projecting ridge or fold above them such as occurs in many Mniotiltidæ. In *Eucometis* and *Mitrospingus*, the feathers come close up to the posterior end of the nostril.

Tongue. The tongue ends in two points, one on each side; there is a series of fine teeth or serrations on each side, each tooth being larger than its proximal neighbor, so that the terminal tooth is the largest. Sometimes the two terminal teeth on each side are of equal size. This sort of a tongue occurs in many Passerine birds which have no close relationship, as the Catbird and the Scarlet Tanager. It is not therefore in any way distinctive.

Pterylosis. The head is fully feathered with no special apteria nor is there any unusual arrangement of feathers in longitudinal series. The upper cervical tract is narrow at first but becomes broader and more densely feathered between the shoulders and then becomes narrow again before joining the dorsal tract. This enlargement of the cervical tract is the only characteristic feature of the general pterylosis. It has not been reported for any other Passerine bird so far as I know, but a somewhat similar arrangement is found in the kingfishers. The cervical tract anterior and posterior to this enlargement is, in *Rhodinocichla*, only three or four feathers wide but the enlargement is six feathers wide. The rhombic dorsal saddle is well-marked and symmetrical and resembles that of *Piranga erythromelas* and many other Passeres. The pterylosis of the lower surface shows no peculiarities save that the ventral tracts are unusually short, narrow and ill-defined. The primaries are rather short and the secondaries long, giving the wing the short, rounded shape characteristic of the genus. The really remarkable fact here is the shortness of the eighth and ninth primaries. In the Mniotiltidæ (with few exceptions) and in most tanagers, the eighth primary is one of the longest and the ninth is little shorter and is longer than the fourth, but in *Rhodinocichla* the eighth and ninth primaries are the shortest and the ninth is even shorter than the secondaries. A very similar arrangement of primaries is however found in *Mitrospingus* which has the ninth primary shortest and the eighth only a little longer, though it exceeds the first. In *Eucometis*, the ninth is longer than the first and second, while the eighth is not much shorter than the fifth, sixth

and seventh. In *Piranga*, the wing is pointed by the ninth, eighth and seventh primaries, the other extreme from *Rhodinocichla*. The latter has nine secondaries and a quintocubital wing of course. There are twelve rectrices which are successively shorter from the middle pair outward. These feathers are notable for their breadth and softness; it is interesting to find the tail feathers of *Mitrospingus* similar.

Alimentary Canal. The arrangement of the intestine and the appearance of the entire alimentary canal is so similar to that of several other Passerine birds examined, *Dumetella*, *Piranga*, *Seiurus*, that no distinctive characters were found. The contents of the stomach were examined in two specimens and while much of the material was unrecognizable to my untrained eye, three items were determined; beetles of at least four species, one of which was a curculio; seeds, of which the most common was the hard gray achene of some sedge; large, irregular grains of sand, with rounded angles and of a bright ochre color. This combination seems to show clearly that the birds are chiefly ground feeders.

Palatine Region. The bony palate of *Rhodinocichla* yields what seems to me the best indication of its relationships. If one compares this part of the skull in tanagers and in wood warblers, two points of difference are shown which seem to be important. In the tanagers, the palatine processes are long and well developed while in the wood warblers they are short and rudimentary. In the tanagers, the maxillo-palatines are parallel for a short distance, about the length of the inflated portion, but in the warblers they are parallel for a considerable distance and the increasing divergence is less marked. Parker¹ examined and figured several species of each family, and I have examined *Piranga erythromelas* and *Seiurus noveboracensis* in addition, and these differences while not ex-

¹ Parker, W. K., 1878, Trans. Zool. Soc. London, vol. 10, pp. 251-314, pls. 46-54. Compare especially figs. 1-6, pl. 46 and figs. 1-3, pl. 48. It may be remarked in passing that Parker makes no reference to a "secondary palatine process" in *Piranga*, although he examined *Piranga rubra*. Shufeldt figured these processes as found in *Habia* (Auk, Vol. 5, p. 439; 1888) and gave them a name. I find them very conspicuous in *Piranga erythromelas* and on consulting Lucas' figure (Proc. U. S. Nat. Mus., vol. 18, p. 505; 1895) it will be seen that he indicates them although he makes no reference to them. There is no trace of them in *Seiurus* or *Dumetella*, nor in *Rhodinocichla*. They appear to be associated with a strongly conirostral beak, though Shufeldt says they are lacking in *Coccothraustes*.

traordinary seem fairly constant. They show more clearly in specimens than in Parker's figures, especially the position of the maxillo-palatines. Now in both these particulars, *Rhodinocichla* is a tanager. The palatine processes are well-developed though not as slender as in *Piranga*, nor as spike-like as Parker figures them for *Tanagra*. The maxillo-palatines are almost exactly like those of *Piranga erythromelas* both in form and position.

Sternum. Some years ago Shufeldt (1888, Auk, vol. 5, p. 442) made the statement that true tanagers "have an osseous bridge extending across the top of the manubrium to the anterior margin of the body of the sternum." He adds that it is absent in *Icteria* and in such Fringillidæ as he had examined. This seems such a trivial character and so unlikely to be constant or clearly shown, that I was inclined to give little heed to it. Nevertheless I made some dissections with the result, surprising to me, of finding this osseous bridge very clearly defined in *Piranga* and totally wanting in *Dumetella*, *Habia*, *Passerella* and *Sciurus*. I am forced to believe therefore that it is a character of no little importance, and it is interesting to find that in *Rhodinocichla*, this osseous bridge is as clearly shown as it is in *Piranga*.

Conclusions. In the British Museum catalogue (1881), Sharpe calls *Rhodinocichla* the "rose-breasted wren" and places the genus in the Miminae near *Harporhynchus*, remarking that it is one of several genera which appear to connect the mocking-thrushes and the wrens. It was not until 1901 that Ridgway called attention to the important fact that there are only nine developed primaries in *Rhodinocichla* and that it must therefore belong in some one of the nine-primaried groups. He placed it finally at the end of the Mniotiltidæ with the comment that although it "is very aberrant as a member of the Mniotiltidæ, I do not know where else to place it." When Mr. Bangs placed the alcoholic specimens in my hands, he called my attention to the resemblance to *Mitrospingus* and suggested the possibility of *Rhodinocichla* being a tanager. The evidence which I have presented seems to me to justify the belief that this suggestion has revealed the probable relationships of the genus. The structure of the bony palate and of the sternum are characteristically tanagrine, while the wing and tail show a close relationship to *Mitrospingus*, which has quite generally been re-

garded as a tanager. It is true that the bill is not typically tanagerine but here again there is a close resemblance to *Mitrospingus*. It is a natural conclusion therefore that *Rhodinocichla* is to be regarded as a tanager which has become more or less specialized for a particular manner of life. As the stomach contents indicate a ground feeder, it may be that that method of finding its living has been the factor associated with its specialization.

EIGHTEEN SPECIES OF BIRDS NEW TO THE PRIBILOF
ISLANDS, INCLUDING FOUR NEW TO
NORTH AMERICA.¹

BY BARTON WARREN EVERMANN.

WITH the appointment of a naturalist in the fur-seal service July 1, 1910, and the organization, in the Bureau of Fisheries, of the Alaska Fisheries Service, July 1, 1911, the Bureau at once began the formation of plans for a comprehensive and thorough study not only of the life history of the fur seal but also of the scientific management and conservation of the fur-seal herd that has its breeding grounds on the Pribilof Islands in Bering Sea. The plan is broad in its scope and contemplates a thorough study of all the species of animals and plants found on or about those islands. Dr. Walter L. Hahn, at that time head of the department of biology in the state normal school at Springfield, South Dakota, was appointed naturalist in the summer of 1910. He arrived at St. Paul Island August 24 and immediately entered upon his duties with an energy and intelligence which could scarcely be excelled. His untimely death on May 31, 1911, from exposure in the ice-cold water of the village lagoon, resulting from the capsizing of a boat, was a severe loss to the fur-seal service and to biological science. During his few months on St. Paul Island Dr. Hahn, from the

¹ Published with the permission of the U. S. Commissioner of Fisheries.

voluminous notes and records which he left, appears to have been indefatigable in his field work and marvelously painstaking in recording his observations. His notes, typewritten up to noon of the very day of his death, record a vast number of new and important observations on the fur seals and blue foxes. They also teem with records of interesting observations on the birds and other animals of the islands.

Mr. Millard C. Marsh, pathologist of the Bureau of Fisheries, was appointed to the vacancy caused by the death of Dr. Hahn. He reached St. Paul Island, August 23, 1911, and took up and continued with commendable industry and intelligence the work so ably begun by his predecessor.

Among the observations that are of special interest to the readers of 'The Auk' are those relating to birds.

In this communication I desire to record the species which their observations have thus far added to the Pribilof Islands and to the avifauna of North America.

In Palmer's 'Avifauna of the Pribilof Islands,'¹ 69 species of birds are recorded. To these, one species, the Northern Flicker, *Colaptes auratus luteus*, has since been added by assistant fur-seal agent James Judge, and recorded by Mr. Austin H. Clark.²

To this number I am now able to add 18 species, four of which are new to North America. All the specimens mentioned are now in the United States National Museum.

For assistance in verifying the identifications of these specimens I am under obligations to Mr. Harry C. Oberholser of the Bureau of Biological Survey.

1. *Rhodostethia rosea* (Macgillivray). Ross's GULL.—A fine example in adult plumage was shot on one of the small freshwater lakes of St. George Island, May 25, 1911, by one of the natives. The specimen was preserved by Assistant Agent A. H. Proctor who forwarded it to the Bureau of Fisheries.

This species was first obtained in Alaska by Nelson, October 10, 1879. Since then it has been recorded by Murdock from Point Barrow.³

¹ The Fur Seals and Fur-Seal Islands of the North Pacific Ocean, Part 3, pp. 355-431, 1899, Government Printing Office.

² Proc. U. S. Nat. Mus., Vol. 38, p. 60, 1910.

³ Nelson, Report upon Natural History Collections made in Alaska between the years 1877 and 1881, Government Printing Office, 1887.

2. **Mergus serrator** *Linnaeus*. RED-BREASTED MERGANSER.— A female (No. 55)¹ shot by Dr. Morgan December 16, 1910, on the lagoon, St. Paul Island, and preserved by Dr. Hahn.

Although a common species in many parts of Alaska it had not been previously noted on the Pribilof Islands.

3. **Chaulelasmus streperus** (*Linnaeus*). GADWALL.— A female in good plumage (No. 101) was shot on the lake near Polovina, St. Paul Island, November 13, 1911, by Mr. Marsh who thinks the species is probably not uncommon, but that most of the natives do not distinguish it from the female Mallard.

Among the ducks collected by Dr. Hahn is also a fine male (No. 66) of the European Widgeon, *Mareca penelope*, taken April 30, 1911, which, however, had been previously recorded from these islands.

4. **Spatula clypeata** (*Linnaeus*). SHOVELLER.— A male (No. 74) in excellent plumage obtained May 24, 1911, on St. Paul Island, by Dr. Hahn. Stomach contained larvæ and small seeds.

5. **Dafla acuta** (*Linnaeus*). PINTAIL.— Two males (Nos. 178 and 179) in perfect plumage, were obtained by Mr. Marsh May 24, 1912, at the village pond, St. Paul Island.

6. **Marila marila** (*Linnaeus*). SCAUP DUCK.— A fine specimen, a male (No. 153) of the Scaup Duck or Big Bluebill, was secured on the village pond, St. Paul Island, by Mr. Marsh, April 27, 1912.

7. **Marila fuligula** (*Linnaeus*). TUFTED DUCK.— This interesting duck I am now able to add to the North American avifauna. A female (No. 69) was obtained on St. Paul Island May 9, 1911, by Dr. Hahn who was at first inclined to identify it as an example of the Little Bluebill or Lesser Scaup Duck, *Marila affinis*.

Dr. Hahn states that the stomach was full of grass, cress (?), small seeds and a few larvæ. There was but little fat. The eggs measured 4 mm. in diameter. The bird was accompanied by the male which escaped.

8. **Marila ferina** (*Linnaeus*). EUROPEAN POCHARD.— A male (No. 158) in excellent plumage obtained on St. Paul Island by Mr. M. C. Marsh May 4, 1912. Mr. Marsh states that this duck is "seen occasionally by natives not all of whom recognize it." It is not improbable that they confuse it with other species.

This is the first North American record for this species.

9. **Somateria spectabilis** (*Linnaeus*). KING EIDER.— Although the Pacific Eider had been recorded from these islands, not until now has the King Eider been known to occur there. The collections sent down by Mr. Marsh contain 3 fine specimens of this species, male and female, (Nos. 129 and 132) taken February 4, 1912, and a male (No. 128) taken March 9, 1912, all on St. Paul Island.

10. **Pelidna alpina sakhalina** (*Vieillot*). RED-BACKED SANDPIPER.— One specimen a male, (No. 42) was shot on St. Paul Island, October 30,

¹ The numbers in parentheses are the collector's original numbers.

1910, by Dr. Morgan. On December 11, 1910, Dr. Hahn saw three others which he believed to be this species.

11. **Machetes pugnax** (*Linnaeus*). RUFF.—A young female (No. 22) was secured on St. Paul Island, September 7, 1910, by Dr. Hahn. This is not only the first record of this common European bird for the Pribilof Islands but it is the first for the west coast of America.

12. **Cryptoglaux funerea funerea** (*Linnaeus*). TENGMALM'S OWL.—A female (No. 59) in good condition caught alive in the village on St. Paul Island, January 26, 1911, by a native who brought it to Dr. Hahn. The stomach was empty save for a few hairs. This is the first record for America of this interesting little Owl.

13. **Cryptoglaux funerea richardsoni** (*Bonaparte*). RICHARDSON'S OWL.—A male (No. 111) was shot with a rifle on St. Paul Island February 2, 1912. Although previously known from Alaska this is the first record for the Pribilof Islands.

14. **Euphagus carolinus** (*Müller*). RUSTY BLACKBIRD.—One specimen a male, (No. 99) was obtained near the lake at Northeast Point, St. Paul Island, October 20, 1911. It was shot with buckshot by one of the native watchmen, who brought it to Mr. Marsh. The bird was unknown to the natives.

15. **Coccothraustes coccothraustes japonicus** *Temminck & Schlegel*. JAPANESE HAWFINCH.—A fine example (No. 100) of this interesting Finch new to the American fauna was shot at the village landing on St. Paul Island, by a native, November 1, 1911. It was a new bird to the natives, none of them recognizing it as anything they had ever seen before.

16. **Plectrophenax nivalis nivalis** (*Linnaeus*). SNOW BUNTING.—In 1887 Mr. Ridgway described the Snow Bunting common on the Pribilof Islands as *Plectrophenax nivalis townsendi*.

It was therefore with considerable surprise that, among five specimens of Snow Buntings received from Mr. Marsh one (No. 172) proves to be the typical species. It is a male caught alive in the village of St. Paul March 31, 1912. The other four specimens are typical *P. n. townsendi*.

17. **Zonotrichia leucophrys gambeli** (*Nuttall*). GAMBEL'S SPARROW.—An adult male (No. 180) in fine plumage was obtained by Mr. Marsh, May 24, 1912, on St. Paul Island.

18. **Passerella iliaca insularis** *Ridgway*. KADIAK FOX SPARROW.—One male, (No. 15) was shot among the rocks near Gorbach rookery, St. Paul Island, September 7, 1910, by Dr. Hahn. High northeasterly winds had prevailed for several days. On October 4, another was seen near where the one was killed a month earlier. Still another was seen the same day among the rocks back of Reef rookery, and on October 15, one was seen among the rocks at Kaminista, St. Paul Island, by Dr. Hahn. Mr. Oberholser identifies the single specimen as *P. i. sinuosa* Grinnell which is not regarded as separable from *insularis* in the A. O. U. Check-List.

AN ESSEX COUNTY ORNITHOLOGIST.¹

BY GLOVER M. ALLEN.

IN 1905 the Nuttall Ornithological Club published as No. 3 of its Memoirs, Dr. Charles W. Townsend's 'Birds of Essex County,' the most extensive monograph that had up to that time appeared on the birds of so limited an area of North America. The large number (319) of species which it includes, bears witness not only to the many observers whose notes were available but also to the variety of conditions obtaining in this favored portion of Massachusetts whereby so great a multitude of birds is attracted. Certain species (as the Orchard Oriole, Yellow-breasted Chat, Long-billed Marsh Wren) whose habitat lies chiefly to the south are here at about their northeastern breeding limit, while others, characteristic of more boreal conditions (as Solitary Vireo, Hermit Thrush), find local spots suited to their needs.

The present paper is a further contribution of notes on Essex County birds, gleaned from the records and collections of the late Benjamin F. Damsell, of Amesbury, in the northernmost part of the County. Although a life-long student of birds, he was practically unknown among ornithologists for he published nothing and carried on his studies by himself in a quiet way. At his death, his collections and his note books covering nearly thirty years of continuous observation in the vicinity of his home, passed into the hands of his nephew, Mr. Howard D. Kenyon, of Sharon, Mass., through whose kindness I have been permitted to examine them. Many of the notes are of much local interest and it has seemed worth while to place on permanent record such of these as add to what has been published in the 'Birds of Essex County,' that his labors be not altogether lost. Of Mr. Damsell's life, Mr. Kenyon has most kindly written the following brief sketch.

"Benjamin F. Damsell was born Sept. 6, 1854, in Amesbury, Mass., the son of Thomas and Jane Damsell. He was educated in the public schools of Amesbury and early showed a taste for

¹ Read before the Nuttall Ornithological Club, May 6, 1912.

drawing. His sketches of birds and mammals gave indication that the boy was a good observer with unusual artistic ability. His father was a taxidermist on a small scale and from him Benjamin gained his inspiration for collecting and mounting specimens. His first attempt to stuff a bird seems to have been at the age of twelve years.

"Both parents died in 1866, the home was broken up, and the boy went to a farm to live. Here among the hills where Massachusetts joins New Hampshire, Mr. Damsell started his collection and began the study of ornithology. Among his first books on the general subject of bird-lore was Cassell's 'Book of Birds.' While at the farm his outings took the form of tramps through the woods, for the purpose of studying the birds and adding to his collection. His early advantages were few, but his natural ability, his love for the subject, and his determination to do good work knew no obstacles. In his early days in taxidermy, he bought stuffed specimens and took them apart to study the methods of those who were considered expert. While yet a farmer's boy his pencil sketches of birds and squirrels were replaced by successful efforts at oil painting.

"Tiring of the limitations of farm life he learned the carriage builder's trade. In 1881 he married Miss Emma F. Day, of Amesbury, and continued to reside in his native town.

"For years he reserved Saturdays for hunting trips. Oftentimes when business was dull a large portion of his time was given to taxidermy and painting. All his work seemed to combine the skill of the mechanic with the touch of the artist. He bought the best books, studied the best methods, with the result that his knowledge of birds was comprehensive and exact.

"Most of his hunting was done in the vicinity of Amesbury and on the great meadows of Salisbury and of Hampton, N. H. For forty years he continued to study, collect, and mount specimens. His collection was reasonably complete in those birds that frequent northeastern Massachusetts and his notes were kept until within a few weeks of his death. He was well known as a taxidermist in the nearby towns of Newburyport, Haverhill, Hampton, and Exeter.

"After an illness of several months he passed away June 8, 1911.

His attainments were such that had he not chosen to live the quiet, retired life of his native hills, he would have won distinction in the artistic and mechanical side of taxidermy. By those who knew him he will ever be remembered as a man of unusually lovable qualities and nobility of character."

The notebooks, from which the following items are abstracted, cover the period from 1880 to 1911, and though at first confined to records of birds shot, became later more systematic, with entries of all dates on which the different species were seen or killed. Beyond this there is rarely more than an occasional remark concerning some unusual circumstance, except for dates when birds were seen mating or when eggs were found. In addition to the notes on birds, several pages in some years are given to lists of local trees with dates on which they first bloomed or put out their leaves, when the first thunder shower occurred, the first frogs were heard, and the like. The bird records seem to be made with much caution and as they are frequently substantiated by the actual specimen, may in most cases be deemed wholly trustworthy. Part of the collection was destroyed but the remainder is in good condition and consists of several hundred mounted specimens, some of the more interesting of which have been acquired by the Boston Society of Natural History for its New England collection.

In the paragraphs which follow, it is to be understood that unless definitely mentioned, the locality is Amesbury, Mass., or the immediate vicinity.

1. ***Uria lomvia lomvia***. BRÜNNICH'S MURRE.—An unusually early date of appearance is November 9, 1901. Late November is the usual time for this bird on our coast. The first fall arrival is noted on November 24, 1890, and November 28, 1893.

2. ***Sterna hirundo***. COMMON TERN.—The increase in numbers of this species on our coast of late years due to the protection afforded the breeding birds is evidenced by the entries in the notebooks. Although rarely recorded in summer previous to 1906, yet after that date it regularly appears during late July and in August.

3. ***Oceanodroma leucorhoa***. LEACH'S PETREL.—On October 16, 1887, one was shot at Kimball's Pond, a large body of fresh water a short distance inland. It is a striking fact that the inland records for this bird in New England are mainly of specimens seen on ponds or rivers during the middle of October. Possibly these petrels are then in active migration south and at that time more frequently wander or are blown inland.

4. *Phalacrocorax carbo*. CORMORANT.—An interesting case is recorded of a Common Cormorant that was seen to be harassed by two Kingbirds at Amesbury on June 18, 1895. It sought refuge in an oak tree and fell to the ground where it was captured. An examination showed that one wing had been broken but had healed. The bird was a male.

5. *Phalacrocorax auritus auritus*. DOUBLE-CRESTED CORMORANT.—A midsummer bird is noted as shot at Kingston, N. H., July 10, 1891.

6. *Pelecanus occidentalis*. BROWN PELICAN.—An immature bird, taken May 1, 1907, off Great Boar's Head, Hampton Beach, N. H., was mounted by Mr. Damsell, and later purchased by Col. John E. Thayer who presented it to the Society. It has not apparently been recorded.

7. *Anas platyrhynchos*. MALLARD.—Occasionally taken, in one instance a late male, on December 2, 1904. A pair shot at True's Pond, October 16, 1893, weighed—the drake $2\frac{1}{2}$ pounds; the duck 2 pounds.

8. *Nettion carolinense*. GREEN-WINGED TEAL.—An early record is of one shot March 23, 1889. In 1898, one was killed on December 2.

9. *Querquedula discors*. BLUE-WINGED TEAL.—The only spring specimens noted are: one on March 21, 1898, and a male, April 24, 1897.

10. *Spatula clypeata*. SHOVELLER.—This unmistakable species is twice recorded, once in spring, April 6, 1893, and once in fall, September 3, 1894. Both dates extend those recorded for Essex County.

11. *Aix sponsa*. WOOD DUCK.—A late bird is noted on December 16, 1903.

12. *Marila americana*. REDHEAD.—A single specimen was taken October 14, 1893.

13. *Marila collaris*. RING-NECKED DUCK.—But one record is given for Essex County in Dr. Townsend's memoir. Mr. Damsell, however, has a record of a bird on April 7, 1889.

14. *Somateria dresseri*. AMERICAN EIDER.—The collection contains several specimens of this duck, and the notebooks record it once as early as September 20, 1903, an unusually forward bird.

15. *Somateria spectabilis*. KING EIDER.—The single record for Essex County is the specimen taken at Marblehead, November 24, 1889. It is therefore of interest to find that a second was shot at nearly the same time by Mr. Damsell, namely on November 29, 1889. It was a young male.

16. *Chen hyperboreus hyperboreus*. LESSER SNOW GOOSE.—A Snow Goose, shot October 7, 1888, is among the birds whose measurements are entered in one of the notebooks. The wing length is there recorded as $14\frac{1}{2}$ inches, which indicates the Lesser Snow Goose. In the notebook for 1902, is the entry: "Albert Shaw shot a Snow Goose," but the exact date, if known, was not recorded. A further entry records, February 18, 1902, "Saw a flock of Snow Geese."

17. *Anser albifrons gambeli*. WHITE-FRONTED GOOSE.—Previous to 1905, there were no records of this bird for Essex County. Mr. Damsell

notes two, however, that were killed on the Salisbury marshes October 5, 1888.

18. *Ixobrychus exilis*. LEAST BITTERN.—Records for this elusive bird are few in the northeastern extreme of its range. Mr. Damsell's notebooks record it twice in fall: September 21, 1887, and September 1, 1888.

19. *Herodias egretta*. AMERICAN EGRET.—A 'white heron' shot September 19, 1887, is recorded, together with measurements of the bird. The wing, 16 inches, and tarsus, 6 inches, indicate that it was *H. egretta*. The notebooks also record another white heron at Salisbury, August 5, 1907.

20. *Rallus elegans*. KING RAIL.—A specimen is noted on August 14, 1902.

21. *Gallinula galeata*. FLORIDA GALLINULE.—Most of the few records for Essex County are of October birds. Mr. Damsell's collection contained two birds, one taken September 14, 1887, the other October 3, 1903.

22. *Lobipes lobatus*. NORTHERN PHALAROPE.—Data on the occurrence of these birds are always interesting. I find one spring record, May 18, 1904; and one of a bird 'in full plumage' (and so perhaps a care free female) on July 31, 1905, a rather early date.

23. *Recurvirostra americana*. AMERICAN AVOCET.—The collection contains a fine adult female of this species, taken May 23, 1887, doubtless on the Salisbury marshes. That it was a locally obtained specimen there can be no doubt, as it was skinned, sexed and measured by Mr. Damsell. His notebook simply makes record of it as the first of its kind observed, for in these earlier days of his collecting he seems not to have been aware of the rarity of his capture. The specimen has been acquired by the Boston Society of Natural History for its New England Collection. There are but three other instances on record of the appearance of this species in Massachusetts, one of which is indefinite and the others of fall birds. That this straggler should have appeared in spring is therefore of unusual interest.

24. *Philohela minor*. WOODCOCK.—The notebooks contain a number of records of late fall birds, as follows: November 20, 1886, December 10, 1887, November 21, 1880, November 18, December 6, 1890, November 30, 1893, December 5, 1903.

25. *Gallinago delicata*. WILSON'S SNIPE.—Dr. Townsend indicates that this bird is occasional in winter in Essex County. Mr. Damsell notes one November 24, 1896, at Amesbury; and records one shot at Newburyport on February 8, 1889.

26. *Micropalama himantopus*. STILT SANDPIPER.—The notebooks extend somewhat the limits of the fall migration of this species as recorded for Essex County, viz., July 22 to September 16. Thus I find entry of specimens shot September 15, and 17, 1893, and October 2, 1895.

27. *Limosa fedoa*. MARBLED GODWIT.— This bird is now so rare as to be considered 'accidental' in Essex County. It is therefore worth noting that one was shot July 28, and another July 30, 1888.

28. *Limosa hæmastica*. HUDSONIAN GODWIT.— 'Large flocks' are recorded September 7, 1891, and single birds shot August 24, 1889, August 31, and September 2, 1903.

29. *Bartramia longicauda*. UPLAND PLOVER.— A very late bird is one shot by William Thompson on October 26, 1901. In 1896, there are records of this species at Amesbury on July 10, and in August, but in other years rarely more than once in the late summer.

30. *Numenius americanus*. LONG-BILLED CURLEW.— There are two records for this bird in the notebooks, namely of specimens taken probably on the Salisbury marshes, July 21, 1887, and July 25, 1891. Although the Hudsonian Curlew is often mistaken for this species by gunners, I am confident that these records may stand.

31. *Numenius hudsonicus*. HUDSONIAN CURLEW.— The notebooks contain frequent mention of this species among birds shot in August and early September. A flock of thirty was seen August 2, 1907.

32. *Numenius borealis*. ESKIMO CURLEW.— A few additional records for this nearly or quite extinct species are: August 31, 1889, 'shot one in the marsh'; August 28, and 29, 1893, specimens shot. There are no records in the books of later date.

33. *Charadrius dominicus dominicus*. GOLDEN PLOVER.— The only spring record is May 18, 1903, and may, I think, be accepted as the bird was thoroughly familiar to Mr. Damsell.

34. *Oxyechus vociferus*. KILLDEER.— The memorable winter flight of these birds in 1888 was noticed at Amesbury, where on December 4, four were shot, and two the following day. In 1884, a bird was shot on the marsh in August, and in 1895 one is recorded November 25.

35. *Colinus virginianus virginianus*. BOB-WHITE.— Essex County is close to the critical limit for this species in its northeastward range. In the notebooks, it is entered nearly every year among the birds seen about Amesbury, but after 1905, it appears no more.

36. *Ectopistes migratorius*. PASSENGER PIGEON.— Mr. Damsell was quite familiar with this species and the Mourning Dove, and his collection contains specimens of both, locally obtained. Of the Pigeon, a male and a female were shot on August 24, 1886. In 1887, the species is entered twice, on April 23 and November 29. The year 1888 is the last year in which the Passenger Pigeon was observed, a flock of five on May 6. This was about the year when the bird practically disappeared from New England.

37. *Zenaidura macroura carolinensis*. MOURNING DOVE.— One is recorded February 24, 1890, and another January 9, 1892; the extreme dates for this bird are, with these exceptions, March 31 to November 2, (1894).

38. **Buteo lineatus lineatus**. RED-SHOULDERED HAWK.—The occasional gathering of this species into large companies during migration, was noticed on September 18, 1886, when a 'flock of about 300' passed at Amesbury.

39. **Haliaeetus leucocephalus leucocephalus**. BALD EAGLE.—The notebooks contain several winter records for this bird, whose occasional appearance is always a matter of interest. In 1890, 'one dark and two white-headed birds' were seen March 1, and a single bird May 30. In 1891 there are records for February 7, July 15, August 3 and 11, December 20. In 1903, one was seen, January 5, at Hampton, N. H. These winter records are of interest as showing the bird's occasional presence on the coast during the winters, while inland among the mountains and lakes of New Hampshire they are summer visitors.

40. **Scotiaptex nebulosa nebulosa**. GREAT GRAY OWL.—An unrecorded specimen of this rare owl was in Mr. Damsell's collection, and has been acquired by the Boston Society of Natural History. It was shot January 6, 1894, in the Great Swamp at Amesbury.

41. **Cryptoglaux funerea richardsoni**. RICHARDSON'S OWL.—Two mounted specimens obtained in the vicinity of Amesbury are in the collection; the first was taken February 25, 1889, the second, a male, on January 5, 1903.

42. **Nyctea nyctea**. SNOWY OWL.—Although generally considered a very irregular winter visitor, it is worthy of note that it is almost yearly recorded in the notebooks. The years and dates are given in full in case they may have value in connection with the notices of flights recorded by Mr. Ruthven Deane. They are: 1886, November 26, December 10; 1887, February 10; 1889, November 8; 1890, January 23, February 13 (Hampton River, N. H.), November 28, December 6, 11, 20, 24; 1891, December 16; 1893, November 7; 1896, November 16, ♂; 1901, December 26, two, December 28; 1902, January 3, 11, 18, 25, February 3, 4, April 3, October 18, 23; 1903, March 12; 1905, November 21.

43. **Coccyzus americanus americanus**. YELLOW-BILLED CUCKOO.—The Black-billed is the Cuckoo commonly represented in Essex County, while the Yellow-billed species more rarely reaches northern Massachusetts and southern New Hampshire. This is shown well by Mr. Damsell's records, in which the latter bird is entered but five times in seventeen years. In 1884, one was shot May 23, and a second on June 14. In 1901 a nest and eggs were found on June 24. A bird was taken August 24, 1903, and the final one noted May 17, 1906.

44. **Dryobates villosus villosus**. HAIRY WOODPECKER.—Although this bird breeds sporadically in Essex County and in general is considered a resident species wherever found, a tabulation of all the entries in the notebooks, covering twenty-six years, brings out very strongly the fact that on the coast in the vicinity of Amesbury, at all events, the Hairy Woodpecker appears very regularly during October and November in small

numbers, but only rarely in the winter and spring months. Thus out of the twenty years in which it is recorded, there are but two September entries; in eleven years it was noted in October and in five years not until November. During these two months there are sometimes as many as five or six records for each month. In four years there are from one to three December occurrences; one record each for January and February, two for early April, and one for May, all in different years. The last is of one seen May 30, 1890, a date that indicates perhaps a nesting bird. With us in central New England there is unquestionably a slight movement of these birds in late fall into woodlands from which they are absent in summer, but during the winter most of them seem to disappear again.

45. *Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.—The measurements of a bird taken November 24, 1883, are recorded in one of the notebooks. Another specimen is entered October 28, 1887, both no doubt from Amesbury. It is interesting that though both species of the Three-toed Woodpecker are found together in the White Mountains as residents, the Arctic is the more given to wandering, and is the one oftener noted in fall and winter outside of its summer range, while the American Three-toed Woodpecker much more rarely appears as a visitor south of its breeding range.

46. *Sphyrapicus varius varius*. YELLOW-BELLIED SAPSUCKER.—Although a July and an August record for Essex County are given by Dr. Townsend, he does not adduce any evidence of its breeding. Mr. Damsell's notes contain several mentions of this woodpecker in May and June, as follows: a male May 5, 1887; a bird shot at 'the farm' May 4, 1889; one shot at True's Pond, May 6, 1893; one June 12, 1891; one May 18 and 21, 1907. Perhaps an occasional pair nests in the swampy woods of this region. A late bird is noted on November 4, 1890.

47. *Phlœotomus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.—So rare is this bird in the eastern part of Massachusetts that the only specific mention of its occurrence in Essex County relates to one at Manchester in December, 1885. Two additional instances are supplied by Mr. Damsell's notes, namely, a young male shot July 8, 1886; and a bird shot by one Moses Tewksbury at Kimball's Pond, October 4, 1895. Both these were mounted, and the measurements of the former are entered in one of the notebooks. Probably these were wanderers from central Massachusetts or New Hampshire.

48. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—One was shot at East Salisbury, August 30, 1884.

49. *Antrostomus vociferus vociferus*. WHIP-POOR-WILL.—Mr. Damsell's notes extend slightly the extreme dates recorded for the presence of this bird in Essex County. In 1902 it was first noted April 28, and in 1891 a late bird is entered October 3.

50. *Chordeiles virginianus virginianus*. NIGHTHAWK.—On May 30, 1890, is the interesting note that Nighthawks were seen 'in flocks,' evidently late migrants bound still farther north.

51. *Chætura pelagica*. CHIMNEY SWIFT.— In 1898 Swifts remained unusually late and are entered almost daily till October 4.

52. *Empidonax trailli alnorum*. ALDER FLYCATCHER.— On June 8, 1890, a nest and four eggs were found near Amesbury; the bird is again recorded May 30, 1892, July 2, 1894, and May 25, 1901.

53. *Perisoreus canadensis canadensis*. CANADA JAY.— One was taken February 13, 1904, at Newton, New Hampshire, not far from the Massachusetts boundary.

54. *Sturnella magna magna*. MEADOWLARK.— The notes make but few records of the Meadowlark in January and February, namely February 10, 1894; January 15 and 25, 1902; February 23, 1910. Of late years it seems as if this bird was more regularly found in winter than before along the coastal marshes of the northeastern part of its range. Previous to 1905 Dr. Townsend had but a single January record for Essex County.

55. *Icterus spurius*. ORCHARD ORIOLE.— The breeding range of this bird extends in a narrow strip along the Essex County coast, and at Ipswich it has been found with some regularity. North of the Massachusetts line it has been rarely found as a straggler only. In Mr. Damsell's notes covering twenty-six years of observations at Amesbury it is entered three times, namely, July 4, 1883, one seen at Newburyport; May 12, 1891, and May 21, 1900, one noted at Amesbury.

56. *Icterus galbula*. BALTIMORE ORIOLE.— An interesting note records that on November 29, 1897, one was seen in Dover, N. H., 'with English Sparrows.'

57. *Quiscalus quiscula æneus*. BRONZED GRACKLE.— November 6, 1890, a 'large flock' was seen, a late date for such numbers. One was shot February 6, 1897, which may have been a wintering bird.

58. *Calcarius lapponicus lapponicus*. LAPLAND LONGSPUR.— Although prior to 1902 there were apparently no records of this bird in Massachusetts during winter, Mr. Damsell notes one shot January 10, 1885, probably on the seashore at Amesbury.

59. *Cardinalis cardinalis cardinalis*. CARDINAL.— On September 27, 1889, one was shot at True's Pond, Amesbury. It is interesting that Dr. Townsend records a pair at Amesbury on May 19, 1901.

60. *Piranga erythromelas*. SCARLET TANAGER.— 'A male in full plumage,' August 26, 1897.

61. *Bombycilla cedrorum*. CEDAR WAXWING.— Usually the note-books do not record this species at Amesbury until May. There is commonly a well defined movement of Waxwings in southern or central New England during late January and February, when they appear with Robins, presumably from farther south. This early migration reaches southern New Hampshire, but apparently with considerable irregularity. At Amesbury, Mr. Damsell records two Cedar birds February 1, 1887, and a flock on February 19, the same year, but in other years this early flight is not mentioned. On September 10, 1889, old birds were seen still feeding their young.

62. **Vireo griseus griseus**. WHITE-EYED VIREO.—This vireo bred at least till lately in Essex County, but mainly in the more southern and eastern portions. Mr. Damsell records that on July 1, 1890, he shot one at Amesbury. Possibly a pair bred near there that year.

63. **Dendroica coronata**. MYRTLE WARBLER.—For how many years this bird has wintered to the north of Cape Ann, seems now beyond discovery. Mr. C. J. Maynard did not know of them in winter at Ipswich from 1868 to 1872, and the recent increase in the area of evergreen trees in that region may account for the numbers of wintering birds to be found there at the present day. At East Salisbury, Mr. Damsall shot one on January 23, 1884, and in several of the succeeding years he records it at Amesbury, namely, February 10, 1887, a flock of five or ten; December 17, 1887; December 28, 1891; December 30, 1893; February 10, 1894; January 1, 1901. These sporadic records do not seem to indicate that the Myrtle Warbler winters at Amesbury and vicinity with anything like the regularity that it does at such favored localities as Ipswich or at Cape Elizabeth, Maine.

64. **Dendroica fusca**. BLACKBURNIAN WARBLER.—A rather early date of arrival is May 5, 1886, when two males are recorded.

65. **Oporornis agilis**. CONNECTICUT WARBLER.—Mr. Damsell's notes make mention of a specimen shot September 27, and another September 28, 1893, while a third was killed October 2 of the same year.

66. **Oporornis philadelphia**. MOURNING WARBLER.—There are two instances in the notes when this rare warbler was seen at Amesbury — May 30, 1888, and May 30, 1892. I saw a bird at Ipswich on June 3, 1912. These seem to be the only definite dates published for Essex County.

67. **Icteria virens virens**. YELLOW-BREASTED CHAT.—One was shot at Amesbury on September 30, 1882 — of interest both on account of the late date and the locality. There is little probability that it had bred in the vicinity but may have wandered from the breeding stations in the southern part of the County.

68. **Anthus rubescens**. PIPIT.—The single spring note of this species in Mr. Damsell's books refers to one observed May 9, 1904. Dr. Townsend's spring records for the County are May 9, 1893, May 10, 1903, and June 8, 1878. The fall dates in the notebooks extend from September 10 (1887) to December 1 (1891.)

69. **Mimus polyglottos polyglottos**. MOCKINGBIRD.—Of late years, records for this bird in eastern New England have multiplied and should be gathered together to determine if this species is not becoming increasingly more common as a visitor and resident. That even a large part of the many recorded cage-birds seems unlikely. In Mr. Damsell's notes a Mockingbird is entered as seen at Amesbury, November 7, and again December 16, 1893, perhaps the same individual on both occasions.

70. **Regulus calendula calendula**. RUBY-CROWNED KINGLET.—A late bird was shot at Amesbury, November 26, 1885.

71. *Hylocichla guttata pallasi*. HERMIT THRUSH.—The Hermit Thrush breeds regularly along the coast of New Hampshire in the white pine woods, but in Essex County it becomes local and less common as a summer resident. Thus Dr. Townsend records its breeding at Lynn, North Beverly, between Gloucester and Magnolia, and in Essex, Georgetown, and Boxford. Judging from Mr. Damsell's notes it breeds with some regularity in the vicinity of Amesbury. Thus he found its nest and eggs on May 30, 1888, and again on June 1, 1894. In 1893 the bird is noted throughout May, and several times in June, July and August, 1898. A late bird was seen December 2, 1891.

72. *Sialia sialis sialis*. BLUEBIRD.—An early arrival was noted on February 16, 1902, and a male on the 27th of the same month.

CONTRIBUTIONS TO AVIAN PALEONTOLOGY.

BY R. W. SHUFELDT.

I. THE STATUS OF EXTINCT MELEAGRIDÆ.¹

Plate III.

UP to the present time, there have been but three species of fossil *Meleagridæ* described and recorded, and these are correctly listed — in so far as their names go — on page 388 of the third edition of the A. O. U. Check-List of North American Birds. Two of these, namely *M. antiqua* and *M. celer*, were described by Marsh, — the former being from the Oligocene (White River) of Oregon [?], and the latter from the Pleistocene of New Jersey.

It may be of interest, but surely of no importance, that Marsh also described other fossil remains of a bird as *M. altus* from the "Post-pliocene" of New Jersey, which has since been discovered to be but a synonym of *Meleagris superba* of Cope.

M. superba is the third species listed in the A. O. U. Check-List, and is said to have come from the Pleistocene of New Jersey. On

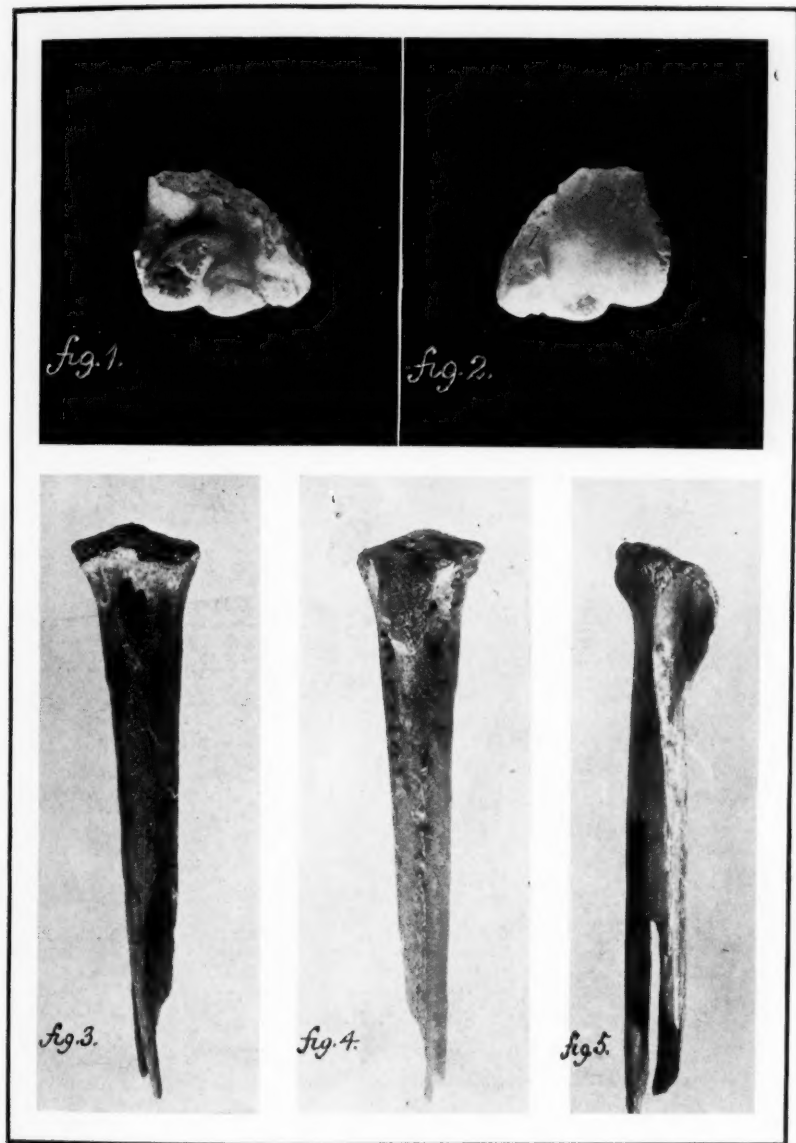
¹ *The Illustrated Outdoor World and Recreation of New York City* will soon publish in serial form a "History of the North American Turkeys" by E. A. Mcllhenny, to appear as a book later on. The present article forms, in part, one of the chapters on Prehistoric Turkeys.

the 25th of April, 1912, Dr. George F. Eaton wrote me that the material, upon which *M. altus* is based, "is in the Peabody Museum (type) with other types of fossil *Meleagridæ*."

Cope's description of *M. superbus* occurs in the Trans. Amer. Phil. Soc. (N. S. xiv. Pt. 1, 1870, 239); it being a very careful and detailed piece of work, based on the material before him, which is said to have consisted of "a nearly perfect right tibia, an imperfect left one, a left femur with the condyles broken off, and a right coracoid bone, with the distal articular extremity imperfect." In my opinion, there would be ample here to establish a fossil species of bird, especially if placed in the hands of a good comparative avian osteologist. Personally, I have never seen the material upon which *M. superba* was established; but, judging from its character and its amount, I am strongly inclined to believe that Professor Cope had a fossil American Turkey before him,— at least the fossil remains of one.

Professor Marsh would never allow me to examine and compare the fossil bones which he described as those he suspected of belonging to extinct turkeys, and I never did so during his life-time. Several years after he had attempted to establish *M. altus* (now known to be only a synonym of *M. superba* Cope), I informed him that I was not prepared to accept his conclusions in the matter; and finally it came to pass that I published in a paper what I desired to set forth on the subject. This paper was entitled "On Fossil Bird-bones Obtained by Expeditions of the University of Pennsylvania from the Bone Caves of Tennessee" (American Naturalist, July, 1897, 645-650); and, in connection with other things said in it, I pointed out that among the bones found, many of them belonged to *M. g. sylvestris*.

Admitting the establishment of *Meleagris superba* of Cope, we have now to discuss the two other species. These are, as stated above, *Meleagris antiqua* (1871), and *Meleagris celer* (1872), both recorded by Professor O. C. Marsh. In my above cited paper on the Tennessee fossil bird-bones, p. 648, I have commented on the validity of these species as follows: "Professor Marsh at different times has described three species of alleged extinct Turkeys, viz., *Meleagris antiquus*, *M. altus* and *M. celer*; but I am very sceptical indeed in regard to the validity of the first-named,



FOSSIL MELEAGRIDAE.



i. e., *Meleagris antiquus*; or, in other words, I doubt the propriety of basing a new species of fossil turkey upon "the distal end of a right humerus," as Professor Marsh has done in this case. Nor do the characters he describes for this species, as being diagnostic, hold true. It is a positive detriment to science, in my estimation, to create new species of fossil birds upon the distal ends of long bones; and surely no assistance whatever to those who honestly endeavor to gain some idea of the avian species that really existed during prehistoric times. So far as *M. altus* and *M. celer* are concerned, I can only say that I know nothing of them from personal examination of the material upon which the species are based, and this has been refused me."

"In the case of *Meleagris altus*, Professor Marsh says that the length of the tarso-metatarsal is equal to 176.5 mm. (p. 261), and the present writer says that it is by no means uncommon to find the same bones in adult specimens of *M. gallopavo* fully of that length, if not longer. The other characters Professor Marsh enumerates, may each and all be due to sexual and individual variations."

"In the case of *Meleagris celer*, this likewise holds true; and in regard to the statement that the "remains preserved indicate a bird about half the bulk of *M. altus*," may be said with equal truth of *M. gallopavo*, in which species a similar discrepancy in size also exists between sexes and between the old and young."

"In other words, I am of the opinion, so far as I am able to judge from his descriptions, that when Professor Marsh described his three extinct and new species of *Meleagris*, he had nothing more or less before him than the very meagre and fragmentary remains of *M. gallopavo*."¹ As pointed out below, these birds may not have been true turkeys at all.

It is clear, from Professor Marsh's description, that he attempted to establish *Meleagris antiqua* upon an *imperfect* distal extremity of a right humerus, and *M. celer* upon the fossil bones enumerated below. It has already been pointed out in a previous paragraph that I found not a few fossil bones of *Meleagris g. silvestris* in the material which was taken from the Bone Caves of Tennessee,

¹ The American Journal of Science, ser. 3, ii, 1871, 126. (*Meleagris antiqua*.) The title is on page 120.

while no such bones occurred in the great mass of fossil bird bones from the Oregon desert.¹

Believing that things might have changed a little since the time Professor Marsh declined to allow me to examine the fragments of fossil bones upon which he had attempted to establish three extinct species of *Meleagris*,— a matter of some fifteen years ago,— I wrote a letter to Dr. George F. Eaton (April 19, 1912) of the Yale University Museum. This brought a reply next day, and in this he kindly stated that he would bring my request before Professor Charles Schuchert, curator of the Geological Department of the Peabody Museum of Natural History of Yale University. With great promptness and marked courtesy, Professor Schuchert (May 2, 1912) sent me, by registered mail, Marsh's *type specimens*, which he had used in his descriptions of *Meleagris antiqua* and *M. celer*. On the third of May, 1912, this material came safe to hand, and I immediately made a complete set of photographic negatives of the specimens.

I desire to express my thanks for the courtesies and privileges extended to me in this matter by Dr. Eaton, Professor Schuchert of Yale University; Drs. James E. Benedict and Charles W. Richmond of the U. S. National Museum, and Mr. Newton P. Scudder, Librarian of the same institution. Through their aid, I was enabled to examine and compare, with Marsh's fossils before me, a mounted skeleton of a wild turkey (*M. g. silvestris*), taken many years ago by Professor Spencer F. Baird at Carlisle, Pennsylvania, and to consult all the existing literature on the subject. Upon examining the material forwarded me by Professor Schuchert after it came into my hands, I found first, in a small tube closed with a cork, the distal end of the right humerus of some large bird. The cork was marked on the side "Type"; on top "*Mel. antiquus*. G. Ranch. Col. G. B. G. Aug. 6th, 1870." The specimen is pure white, thoroughly fossilized, and imperfect. The second of the two specimens

¹ Shufeldt, R. W. 'A Study of the Fossil Avifauna of the Equus Beds of the Oregon Desert.' Journ. Acad. Nat. Sci. Phila., ser. 2. IX. 1892, pp. 389-425, Pls. XV-XVII. Advance abstracts of this memoir were published in 'The Auk' (Vol. VIII, No. 4. Oct. 1891, pp. 365-368). The American Naturalist (Vol. XXV, No. 292, Apr. 1891, pp. 303-306, and *Ibid.*) No. 297, Sept. 1891, pp. 818-821) and elsewhere. Although no turkeys were discovered among these fossils, there were bones present of extinct grouse.

received is in a small pasteboard box, marked on top "*Birds*. *Meleagris*, sp. nov. N. J. *Meleagrops celer* (type)." The specimen is the imperfect, proximal moiety of the left tarso-metatarsus of a rather large bird. It is thoroughly fossilized, earth-brown in color, with the free borders of the proximal end considerably worn off. On its postero-external aspect, written in ink, are the words "*M. celer*." On the cork of the vial containing the end of the humerus, the initials G. B. G. are, without doubt, those of Dr. George Bird Grinnell; and, as he there states that the specimen was collected at G. Ranch, Colorado, it is clear that the locality given (Oregon) in the last edition of the A. O. U. Check-List is incorrect. Besides, Marsh states in his article that the fossil was from Colorado; and this is further evidenced in the fact that the fragment is *pure white*, which is so characteristic of such fossils found in the White River region of Colorado.

My comparisons of Marsh's specimens of his alleged fossil turkeys with the corresponding bones of the skeleton in the case of *Meleagris gallopavo silvestris*, were most critical and thorough. Everything to make such comparisons complete were at my disposal for several hours, and no pains were spared to do the subject justice.

Marsh, in his article, evidently attached but little or no importance to the "other fragments" which were found with those upon which he based his descriptions; and from this fact it is fair to presume that they must, indeed, have been very fragmentary.

It has been unfortunate for science that Professor Marsh in his life-time was enabled to pay such scant attention to the osteology of existing birds; his weakness in this particular is evidenced in not a few places throughout his writings, as I have elsewhere pointed out.¹

¹ Marsh, O. C. *Odontornithes*. "The Struthious characters, seen in *Hesperornis*, should probably be regarded as evidence of real affinity, and in this case *Hesperornis* would be essentially a carnivorous, swimming Ostrich." (!)

Shufeldt, R. W. *On the Affinities of Hesperornis*. *Nature*, Vol. 43, No. 1104, London, December 25, 1890, p. 176. Review of Professor D'Arcy Thompson's paper, showing the true affinities of *Hesperornis* with the *Colymbidae*, and not with the *Ostriches*. See also Shufeldt's "Comparative Osteological Notes on the Extinct Bird *Ichthyornis*" (*Jour. Anat. and Phys.*, Vol. XXVII., N. S., Vol. VII. Part III. Art. 2. Lond. Apr. 1893, pp. 336-342) where it is shown that Marsh entirely overlooked the relationships existing between *Ichthyornis* and *Rhynchops*, and for the reason that he was not familiar with the skeleton in the latter existing genus of birds.

In the case, then, of *Meleagris antiqua* of Marsh, I am of the opinion that we have not sufficient evidence before us to establish the fact that any such bird ever existed in prehistoric time; my reasons for so believing are the following:—

1. The existing material upon which the species is based is altogether too fragmentary to pronounce with anything like certainty that it ever belonged to a *Meleagris*.
2. The material is not only fragmentary, but very imperfect (see Plate III, Figs. 1 and 2).
3. The fragment does not present the "Characteristic portions" of that end of the humerus in a turkey as Professor Marsh states that it does. In any event, an imperfect distal fragment of the humerus of any big, gallinaceous bird is a very unsafe *bit* to establish a new species upon, and especially a supposed-to-be extinct one.
4. It is open to serious question whether the genus *Meleagris*, as the genus *Meleagris*, existed at all at the time the "Miocene clay deposits of Northern Colorado" were deposited.

In no way do I question that this fragment *may have* belonged to the skeleton of some long ago extinct galline fowl, about the size of an adult existing turkey; but that it was a true *Meleagris*, I very much doubt. It is just as likely to have belonged to many another kind of gallinaceous species, or even to some entirely different kind of bird in no special way related to the turkey.

Coming next to the material representing *Meleagris celer* of Marsh, as described above and here figured in my Plate (Figs. 3-5), a still greater uncertainty attaches to the supposition that it belonged to the skeleton of an extinct species of *Meleagris*.

As above pointed out, this is likewise an imperfect, much worn fragment of the proximal half of a tarso-metatarsus. I am not taking the tibiae mentioned by Marsh into consideration, for of them he says himself that they only "probably belonged to the same individual" (see *antea*). There is no uncertainty about it at all.

Upon comparing this proximal moiety of a tarso-metatarsus of an alleged extinct species of turkey — *Meleagris celer* of Marsh — with the corresponding part of that bone in the skeleton of an adult

Meleagris g. silvestris, it is to be discovered at once that the comparable characters by no means agree.

In the existing species of turkey, there is but a single median groove marking the hypotarsus posteriorly. In Marsh's *M. celer*, the hypotarsus of this tarso-metatarsus is thus *twice* longitudinally grooved.

In *M. g. silvestris*, there is a pronounced ridge of bone extending some distance down the shaft, it being the continuation of the thickened, inner border of the hypotarsus. In the case of the fossil fragment here being considered, this ridge is only *indicated*, and, if it were ever present at all, it is here broken off and missing. It is a dangerous practice to describe parts and characters in fossil bones that are not present there.

Again, in the case of this fossil fragment, its general appearance or *facies* is quite unlike the corresponding part of the tarso-metatarsus in *M. g. silvestris*, or that of any other existing wild turkey. Indeed, off-hand I would say that it never came from the skeleton of any meleagrine fowl at all,—existing or extinct. And, as in the case of the alleged *M. antiqua*, it may have belonged to the skeleton of the tarsus of some other kind of a galline fowl—not a meleagrine one—while it is quite as likely to have belonged to the skeleton of some heron (*Ardea*) or other large wader as it did to a turkey.

For example, in some of the herons "the hypotarsus of the tarso-metatarsus is 3-crested, graduated in size, the outer being the smaller; the tendinal grooves pass between them."¹

It has just been pointed out in the last paragraph that the hypotarsus of the tarso-metatarsus in Marsh's *Meleagris celer* is 3-crested, and the tendinal grooves pass between these crests, as in certain Herons. Mind you, I am not saying that Marsh had the bone of an extinct heron before him; but this is a significant fact, especially when we find, in the case of *M. g. silvestris*, the hypotarsus of the tarso-metatarsus is but 2-crested, having the median groove passing between them.

From fossil material to positively establish an extinct species of *Meleagris*, one should have at least a sufficient part of the

¹ Shufeldt, R. W. Osteological Studies of the Subfamily Ardeinæ. Journ. Comp. Med. and Surg. Vol. X, No. 4, Phila., Oct. 1899, pp. 287-317.

sternum, to pass with certainty on the missing portions; one or two of the long bones complete — or very nearly so — and, if possible, a few skulls and pelvic fragments. Lacking the last, a more or less complete coracoid and scapula are great aids in the matter of establishment. A complete *furcula* is of the utmost importance in a great many birds, and to this the gallinaceous ones are by no means exceptions. But, as in the case of *Meleagris antiqua* for example, Marsh had no such material before him; only the imperfect, fragmentary distal end of a humerus, that was all!

When Professor Cope was good enough to turn over to me several hundred fossil bones of birds for description,—had I made *new species* of all that I *might have done*, there would have loomed up in the list of fossil birds in the A. O. U. Check-List quite an extensive and varied fauna of extinct species and the higher groups; but I passed such fragmentary evidence by, and recommended that it be allowed to stand until some more material came from the same horizon and locality.

This is what should be done in the case of the *two imperfect, fragmentary bits* that Marsh had, and upon which he proposed to establish two extinct species of *Meleagris*.

PLATE III.

Fig. 1. Anconal aspect of the distal extremity of the right humerus of "*Meleagris antiquus*" of Marsh.

Fig. 2. Palmar aspect of the same specimen as shown in Fig. 1.

Fig. 3. Anterior aspect of the proximal moiety of a tarso-metatarsus of *Meleagris celer* of Marsh.

Fig. 4. Posterior aspect of the same fragment of bone shown in Fig. 3.

Fig. 5. Outer aspect of the same fragment of bone shown in figures 3 and 4. All figures natural size. Reproduced from photographs made direct from the specimens by Dr. R. W. Shufeldt.

II. STUDIES OF THE FOSSIL BIRDS OF THE OREGON DESERT.

Some twenty years or more ago, Professor E. D. Cope of Philadelphia placed in my charge for description a large collection of fossil vertebrates, that had been collected by himself and his assistants at Fossil and Silver Lakes in the Oregon Desert. To this collection were added numerous other fossils of a similar description,

which had been collected in the same region by Professor Thomas Condon of the University of Oregon, he being the first naturalist who discovered and collected any of the remains of fossil birds in that interesting locality. Professor Cope's chief assistant at the time was Mr. C. H. Sternberg, now known as one of the veteran fossil collectors of this country.

Ex-Governor Whitaker of Oregon was also an early collector of fossil birds at Fossil and Silver Lakes, and it was he who first discovered the remains of the now extinct swan, named by Cope *Olor paloregonus*.

This remarkable collection, as it came into my hands, consisted principally of the fossil bones of birds, as Cope had already described and published the mammals, fish and other forms.

To the birds, then, I gave especial attention, working the material up in great detail and with all possible care. Later on, the results of my labors were published as a quarto in the Journal of the Academy of Natural Sciences of Philadelphia,¹—a paper which presents what we knew of that region at the time the memoir appeared, together with very full descriptions of all the genera and species of birds I found in the material, of existing as well as extinct forms.

These have, long ago, passed into the literature of the subject, and are more or less known to palæontologists everywhere. Most of this work was done early in the year 1891, at a time when but comparatively few skeletons of existing birds were available, and consequently many of the fossil species remained over,—either not referred to the species they represented, or described as species now extinct.

Nevertheless, some very interesting forms were brought to light, and the character of the ancient avifauna more or less clearly defined. When the collection came into my possession, Professor Cope had already published an account of some of the fossils of birds he had found in it; for example, among the Grebes he was enabled to make out from the numerous fossils such species as *Æchmophorus occidentalis*, *Colymbus n. californicus*, and *Podilymbus podiceps*. He had also described an extinct Cormorant, *Phalacrocorax macropus*, and an extinct Swan and Goose, but had done little else with the collection.

¹ Vol. IX, Pls. XV-XVII, Phila., Oct. 1892.

As will be noted in my Philadelphia Academy memoir, to these I added a Pelican; nine Gulls and Terns, two of the former being new and now extinct; a Phalarope; two Coots, one of which was new and extinct; five Grouse, including a new and extinct genus and two new and extinct species; a large number of Ducks, Geese and Swans; a new and extinct Flamingo; also a Heron; two extinct Eagles; an Owl, and, finally, two new and extinct passerine birds. It is not my intention to refer to any of these here, beyond what has already been said,— the object of the present paper being to set forth the facts that during the summer of 1912 the entire aforesaid collection, with added material from the same localities, likewise a small collection from the U. S. National Museum — also from the Silver and Fossil Lakes region — again came before me for examination. The entire Cope collection now belongs to the American Museum of Natural History of New York City, and it was through the authorities of that institution that I was permitted to review these valuable fossils, and to prepare them for cataloguing. Upon undertaking this, by no means easy task, I found that the collection of bird skeletons at the U. S. National Museum, of existing species of American birds in particular, had been very much increased since the Cope collection first came before me. As a result, far more extensive comparisons could be made, and, naturally, new species and a number of previously unrecognized species came to light.

The enumeration of these will sufficiently account for publishing this brief advance abstract; while the reader, at the same time, is assured that the now completed memoir, covering the entire subject and presenting complete descriptions of all the new discoveries, will appear later under other auspices.

This abstract will list only such additional birds as I have been enabled to add to our lists of fossil forms through the above noted revision.

Among the *Pygopodes* I find two new species of Grebes, both now extinct, and neither apparently very abundant during Pleistocene time,— the first being a Grebe smaller than Holboell's but larger than our existing smaller Grebes; while the other was a Dabchick bigger than the present existing one in our fauna.

I find numerous bones of *Centrocercus urophasianus*, in no way

differing from the corresponding ones as they occur in the skeletons of the species of the present day.

Among the *Anseres*, I have to announce the discovery of *Mergus serrator* and other fossil bones, which appear to have belonged to specimens of *Mergus americanus*; also an undetermined form.

Among the Ducks, I find fossil bones — more or fewer of them — representing, for the first time, *Marila americana* (?) *M. valisineria*; *M. marila* (?); *M. affinis* (?); and *M. collaris* (?). Some of the material belongs to fossil examples of *Charitonetta albeola*, *Histrionicus histrionicus*, *Polysticta stelleri* and *Erismatura jamaicensis*. This last duck had already been found by Mr. L. H. Miller of San Francisco, and published by him in the Proceedings of the California Academy of Sciences.

Some of the bones point almost with certainty to the presence of *Branta c. hutchinsi*, *Branta c. minima*, and with absolute certainty to *Branta bernicla*.

Among the Swans, I find fossil remains of *Olor columbianus*, *Olor buccinator*, and a very large species of a new and now extinct Swan.

Further, I find fossil remains of *Botaurus lentiginosus* and *Ardea herodias*; and those of another heron I have to still consider. It is, however, a true *Ardea* and probably an extinct one.

Finally, I have to make the interesting announcement of having found fossil bones of two species of Eagles, both of which still occur in our existing avifauna; these are *Aquila chrysaëtos* and *Haliaeetus leucocephalus*.

A STUDY OF THE HOUSE FINCH.

BY W. H. BERGTOLD, M. D.

THE characteristic native bird of the cities and towns of Colorado is the House Finch (*Carpodacus mexicanus frontalis*); notwithstanding its sweet and characteristic song, it is commonly mistaken by the average citizen and visitor for the English Sparrow.

Previous to the advent of the English Sparrow in Denver (about 1894, according to the writer's notes) the only bird at all common about the buildings of Denver was this finch. Before the present extensive settlement of Colorado, the House Finch was, so far as one can gather from the reports of the various early exploring expeditions, to be found mainly along the tree covered 'bottoms' of the larger streams, along the foot hills, to a small extent up the streams into the foot hills, and possibly along the streams as they neared the east line of the state.

For the past six years, the writer has systematically and particularly studied this species, bearing in mind several problems concerning it; the data secured in this work is now published for the first time.

It seems desirable to say here that the writer alone is responsible for each and every note, observation, and conclusion given in the following paragraphs, the same having been drawn entirely from his personal studies: everything herein following is published without prejudice to past observations and conclusions.

METHOD OF STUDY.

Under this caption are included the usual general observation of the bird whenever seen in and about the city, and special arrangements at the office and home of the writer, designed to facilitate minute observations, and to bring about a more intimate acquaintance with the bird.

The office is on the sixth floor of a building situated in the heart of the business district of Denver, and provided with suitable food and drinking trays on the window sill. At the house, besides

similar food and drinking dishes, there are special nesting facilities arranged for the birds. During the first year of this special study the nesting boxes were nailed to the house wall, and were very shallow. While such boxes gave the Finches ample opportunity for nesting, and were well patronized, it was soon seen that the shallow character allowed too easy access to the nest, a condition promptly utilized by the English Sparrow, to the great distress of the Finches, and the detriment of their nests, eggs, and young. It was also soon learned that boxes *fastened* to the house did not lend themselves to close and rapid inspection of nests, eggs, or young. Consequently, after the first trials, such nesting boxes as were under a small sharply pitched overhanging eave, were of flat cigar boxes, placed on shelves firmly fastened to the house, provision being made to prevent the box being blown from the shelf, and the whole structure so placed that there was only enough room above the nest-box to admit a small bird, and no more. By this arrangement the boxes could be lifted off the shelf from a near-by window, and taken into the house for a brief inspection. It also gave the Finches some advantage in fighting off the destructive English Sparrow in its persistent raids on their nests.

Those nesting boxes which were placed under a broad horizontal overhanging eave were made in two sections, a smaller inner nesting box telescoping from below into a large outer box, the latter being securely attached to the wall of the house. The inner box sliding upward into the outer box formed for it a false bottom, as it were, and was kept from dropping down by suitably arranged hooks. The top of the assembled box was partly closed over by a cover, an arrangement quite necessary in order that the Finches might put up a better fight against the English Sparrow when it entered from above. These first deep boxes were provided with small holes in the sides for ventilation, but this was later found not only unnecessary, but positively harmful, as it permitted late snow or cold rains to beat in on the eggs or young, causing considerable loss of both. These deeper nesting boxes were also of advantage in preventing the young from flying too early and by the time they were able to fly from the nest to the box top (about 6 inches), they had learned pretty well how to manage their wings, and were able to go, on the first flight from the nest, to nearly

trees or buildings with certainty and safety. During and after the summer of 1908, there were nine of these boxes attached to the house, all in pretty constant use by the Finches.

Drinking places or pans are strikingly necessary in Colorado's dry climate, and our birds visit any accessible water very frequently; hence artificial supplies of water have been peculiarly helpful in the present investigation.

The Finches soon learned that no harm was done to them when the nesting boxes were taken into the house for examination, and soon ceased to fret if a nest was temporarily absent from its usual place. Unless constantly frightened or really harmed, these birds have short memories for minor disturbances. This is well illustrated by one occasion, when a persistent fluttering in a box, located near the writer's sleeping porch, called attention to a nesting female Finch caught and entangled in some string which it had used to construct the nest, the string having become firmly entangled about the bird's foot. The bird would have perished had it not been freed, but in less than fifteen minutes after it was again building as busily as before, notwithstanding the handling incidental to its liberation. This occurrence also shows how well the House Finch lends itself to study. It is not essential for ordinary study that the boxes be taken down daily and brought into the house, as much can be accomplished by inspection with a hand mirror held above the nest.

ABUNDANCE.

In 1881 when the writer first visited Colorado, Denver was a small city of about 30,000 inhabitants, spread over a rather limited area, and built of houses and blocks of very modest dimensions. The House Finch had, however, already taken advantage of the opportunities afforded by the nooks in, and sheltered projections of, houses, barns, and other buildings, to construct nests thereon. The bird was then only fairly numerous, yet its engaging song indelibly impressed itself upon the writer's memory. In the interval since 1881, the multiplication of these birds in Denver has been enormous and it seems reasonable to assume that this increase has

been due largely, if not entirely, to the enlarged facilities for nesting brought about by the presence of buildings erected, and trees and vines introduced, through civilization; and to a larger food supply afforded the birds, resulting from the great increase of seed bearing weeds which has followed the plowing of the virgin prairies on which the city grew. Furthermore the waste food products of this city form a large source of food for these birds, and have added to the other factors leading to the increased abundance of this species. It would appear from this that we have here another example of man's unconscious aid in the multiplication of an indigenous bird population and fortunately for Denver, this species has probably been largely, if not wholly, beneficial, thus making for the community's good.

The House Finch is resident in Denver, though some facts relating to its seasonal incidence lend color to the idea that it may be locally migratory. During August and September of each year there is a noticeable diminution of Finches about the city. This is the time when the burdens of nesting and raising of young are practically over, permitting young and old to flock on the prairies to feed on weed seeds:— numerous records of flocks seen in the suburbs about this time, and later, would confirm the above idea.

It is exceedingly difficult to determine if the same individuals remain in one's neighborhood throughout the entire year. During the summer of 1908 an effort was made to throw light on this question. Sixteen young birds, all raised in the writer's nesting boxes, were tagged with a light brass band, the same having been placed about the right tarsus of each bird before it left the nest. With the exception of one, which was found crushed in the alley the day after it flew from the nest, none of these 16 birds was ever again identified about the premises. This might be taken as meaning that the young did not remain permanently about the nest neighborhood, but it may be that such tagged birds did remain in the neighborhood, but were undetected.

In the summer of 1909, several young birds were tagged with brass bands on the left tarsus, and in 1910 some with brass bands on both tarsi, with the hope that such marking would aid in determining how old a Finch might grow to be if left to nature, and all the vicissitudes of bird life. This tagging has shown definitely

that some, at least, of the Finches remain in one's immediate vicinity the entire year; *e. g.*, ♂, marked October 2, 1909, was seen all the following winter, and again in the succeeding spring, and another, ♂, marked by bands on both tarsi, has been noted about the office building for more than two years.

WINTERING.

Winter in Denver seems to have no terrors for this species. It appears to the writer that the cold season does not trouble the House Finch much so long as the bird is well fed, though many, doubtless, suffer frosting of feet during extremely cold spells, resulting in mutilations referred to later on. The birds roost at night, whenever possible, close to buildings, in vines next to a wall, in a nook or on a moulding under an overhanging eave, and in the folds of awnings, for which places the birds have many fights until all are located for the winter, each going to its accustomed place a considerable time before sunset. The young birds sleep in trees after leaving the nest. They have never been observed to sleep two or more together, but appear, on the contrary, to desire separate places, each by itself. It has seemed odd to find that the birds never use the nesting boxes to sleep in, after the nesting season is over. In December they go to roost early, 4.15 P. M. and sleep with the head under the wing, puffed up like little feather balls.

CENSUS.

Can one form any definite idea as to how many House Finches there are in Denver? This question imposed itself on the writer early in this study, because of the relation of this species to the English Sparrow, and while it is self-evident that any estimate along these lines must be approximate only, it is however, not without interest to try to answer it.

There are in the city of Denver 3500 blocks whereon are to be found buildings of one kind or another. If two Finches are allowed for each block there would appear to be 7000 Finches in the city, a number seemingly reasonable as a minimum estimate. At one

time during the summer of 1908, at least fourteen pairs of Finches were known to be nesting in the block in which the writer lived; thus there were twenty-eight Finches living in this block at that time. It is possible that the unusual nesting facilities at the writer's house may have increased the Finches in the block beyond normal numbers, yet a careful survey of many blocks in other parts of the city justified the writer in feeling that the number of Finches in his block was what one might call "average common." This would give us another estimate, counting only the built up blocks, to wit, 98,000 for the entire city. The writer has actually counted in April more than one hundred Finches congregated on the telephone wires leading to one building, near his office, a structure ornamented with many ledges, lintels, arches, etc., and lending itself well for night lodging places for the House Finch. This date is well on in the early incubation period of the year, and one feels justified in assuming that these birds were not young of the year, or old birds gathered together from a wide area to roost only, but were most likely males going to rest near their nesting locations. This is, furthermore, made more probable by the fact that all of these birds seemed in full spring song, characteristic, practically, of the male only. There could not have been less than 200 birds about this building at the time mentioned, and there were almost as many more on the building on the opposite side of the street, showing that these birds are extraordinarily abundant about the business parts of the city, an abundance which can well compensate for any possible scarcity in the outskirts, though it is readily evident that in the outskirts too, the Finches are quite numerous. If we estimate 200 Finches to each 'built on' block, we would have a Finch population of 700,000, a number to be considered as a maximum, and probably a considerable overestimate, though the writer is by no means convinced that it is actually an overestimate. Averaging the Finch population in another way, one can say that there are four Finches for each of the 35,000 houses (or other buildings) in Denver, resulting in a total of 140,000 House Finches in the city.

No portion of the territory within the corporation limits is without its Finches, and after studying the question with care for years, and considering every way of making an estimate, the writer feels

that it is very reasonable to assume that there are ten House Finches to each platted block within the city, which would give a total of 130,000 Finches, there being 13,000 platted blocks in the city, 3500 of which are built on; this estimate of 130,000 House Finches for the city of Denver is probably far below the actual number.

SONG.

Both sexes sing, though the female's attempts are modest and rather infrequent. That the females sing is indisputable since nesting females have been noticed singing, an observation which precludes mistaking an immature male's singing, for a female's attempt at song. The female's is, however, a weak imitation of the male's vigorous and sweet song, which is best and richest, as with other song birds, during the breeding season, yet there is no month of the year when this song is not heard. During the cold months the birds are comparatively silent but they frequently burst into song on bright sunny winter days, which, with us in Colorado, are very common. The association between these clear bright mild winter days and the singing of the Finches is too obvious to be overlooked. The song is poured forth in volumes while the bird is on the wing, and also when at rest, and reminds one in parts, of that of the Pine Finch. From the middle of January onward, the singing increases with the lengthening days, hushed now and again by extreme cold, and this generous song makes the bird a delight and a joy, one to be harbored and protected.

By attracting the birds to one's windows, one comes so closely in touch with them that opportunities for detailed study are unsurpassed, while the bird's abundance and fearlessness give one the most intimate acquaintance possible. Furthermore, the varied calls and notes of both sexes are of exceeding interest, heard to great advantage in this way through their propinquity. There is a distinct and recognizable difference in the alarm note over the sight of a dog or a cat if it be near the drinking place, and the alarm when one examines the nest. The writer has learned to know when the young are ready to leave the nest by the peculiar coaxing notes of the old birds. During nest building, the male often feeds his busy

mate, as he would a young bird, and at such times the notes uttered by the female are peculiar to this part of the nesting habits. During August and September the song is at ebb, but starts afresh, on a subdued scale, in October.

The young of the year have frequently been heard trying to sing in late summer, a song small in volume but with unmistakable characteristics.

FOOD.

The House Finch will eat almost anything vegetable, though it prefers seeds, and experiments with different seeds show that hemp is selected to the exclusion of all others. Nevertheless it feeds in our streets and alleys, gathering bread crumbs, eating from pieces of bread, apples, oranges, and, in fact, from almost any piece of table refuse. It will consume large quantities of fat, more especially suet. In winter when the ground is unusually deeply covered by snow, these birds wander far and wide over the prairie and vacant city lots, eating weed seeds, particularly those of the so-called Russian Thistle (*Salsola tragus*). It was, to the writer, a most satisfying discovery to find that the nestlings were, whenever possible, fed as soon as hatched and thereafter, on dandelion seeds. Each succeeding year has confirmed this observation and young birds not more than two hours out of the egg have been noted with crops stuffed to repletion with dandelion seeds. At this period of the bird's growth the neck-skin and the crop covering are almost wholly transparent, so much so that one can readily distinguish the dandelion seeds within. The old birds are to be seen at this time busily gathering these seeds for the nestlings, selecting those dandelion blossoms which have matured but are not yet open enough to permit of the seeds being dispersed by the wind. Such blossoms are deftly dissected by the old birds, and each seed taken from the blossom, the pappus being nipped off close to the seed. To insure certainty to the correctness of this observation, the writer has examined the crops of several nestlings killed by English Sparrows, and has been able to say definitely that the crop content, in these instances, was formed wholly of dandelion seed.

If not fed on dandelion seeds, the nestlings are given such food

as the old ones usually consume but the writer has never detected any animal food in the crops or stomachs of House Finch nestlings. This Finch has never been seen feeding from the horse manure of the streets.

The House Finch exhibits, in common with many other birds, a fondness for maple sap, sipping it as it oozes from the cut branches of a spring pruned tree. The only objection my friends hereabout have against the House Finch is that it eats in the spring, leaf and blossom buds from bushes and trees—for example, lilac bushes and apple trees.

VARIATION.

The tameness of the bird and one's proximity to it lent by this method of study make it possible to note and realize the great and marked variation to be found amongst the House Finches: one can learn, not only to recognize different individuals by some peculiar differences in color or marking, but can also notice and recognize shades and extent of color that have been spoken of, and described as forming various races of this species.

This impresses one as though there were spread out before him a large series of skins to study; one feels much as a closet naturalist must feel when he takes in hand such a series and has the satisfaction of elaborating a new geographical subspecies. The extremes in color of feather, bill, tarsus and foot, and the presence or absence of tail emargination become so patent through one's study of the bird in this way that, though these are here seen in birds known to be all of the same subspecies, one is almost persuaded to believe the birds are specifically different. One is impressed, too, by the differences in color, pattern and marking in birds coming from the same brood. Mature males have been seen with *bright yellow throats* and *rumps*, and every shade in the mandibles has been seen, varying from coal black to a gray so light as to be easily mistaken for white.

The more one studies this interesting bird, noticing its extreme variability, the more one muses over the validity of species, realizing more clearly than ever before that species exist for man only; or, if one wishes, one can feel that one is in the presence of the making of species.

In the course of these observations, several birds have been

noticed showing distinct melanistic phases, one female being almost black above, and not from city soiling, as the bird was still black after bathing: as mentioned below, an albino female has been seen during two succeeding seasons, having returned a second time to successfully build a nest in the locality where first observed. A female with a long decurved upper mandible has been watched through several months. This mandible was shaped very much like that of a Cross-bill and was probably not deformed through injury as it closed perfectly in apposition to its fellow of the under side, and was perfectly functional. It may well have been an example of mutation.

Many characteristics, other than physical, of each individual come to light as one watches the birds at close range. Many females are quite tame from the onset, and become steadily more so, allowing one to examine them with a mirror overhead as they are setting, showing no alarm, and even some degree of curiosity. The quarrelsomeness of some, and the gentleness of others are especially patent. The water dishes are as often desired for bathing as for drinking, causing as many disputes over the bath privilege as the birds have over food in the feeding trays. Some are so tame that they come through the open windows into the office during severely cold weather, and perch on the steam radiator which is next to the window sill.

MATING.

The writer suspects that this species mates permanently: it is apt, in all seasons of the year, to come to the food and drinking dishes in pairs. After one becomes well acquainted with this species, one learns that a series of indescribable notes and chirrups betokens a mated pair, and these notes have been heard many times outside the usual mating season, *i. e.*, in the late fall and winter. It is a common thing to see a pair examining nesting boxes, and other eligible nesting sites, in December and January. In the winter of 1906-1907, a pure albino female Finch was observed on the writer's home premises, accompanied by a normal male, which paid particular attention to the albino, being, without doubt in the writer's judgment, the latter's mate, notwithstanding the distance of the ordinary season for pairing and nesting.

NESTS AND NESTING.

The House Finch nests in vines about houses, in sheltered corners and awnings of buildings, in baskets hung on houses, and, in fact, in any place of vantage about a building. It also, though rarely, builds in trees, as high in one instance as twenty feet above the ground; in bushes; and in years past (1894) when the electric arc street lights were covered by a conical metal hood, a number of nests were seen on the cross piece under the hood. Nests have been observed in globes, when partly broken, surrounding incandescent lamps hanging under verandas and *portes-cochères*. These nests were frequently found in very noisy and conspicuous places, *i.e.*, the busy entrance to a large hospital. A pair had a nest, during the past spring, in one of two old-fashioned square lantern-shaped entrance lamps on the University Club, in each of which were two incandescent lamps burning brightly until past midnight. The incubating female was not disturbed in the least by this light, nor by the numerous visitors to the club going by her nest.

The writer has only once noticed the species use an old nest of some other species for nesting purposes, in which case a pair of House Finches relined an old Robin's nest and used it to raise a brood. It will thus be seen that there is a considerable degree of flexibility in the House Finch's nidification traits, a flexibility which probably has helped very largely toward the bird's great increase in Denver.

The writer is fully convinced that nesting bears a large relation to the weather conditions, being controlled largely, perhaps entirely, by the temperatures prevailing over a more or less extended time. Very frequently in Denver, October and November are remarkably mild, and during such mild spells young Finches, in pairs, have been observed inspecting the bird boxes on the house, and on a few occasions in October and November a pair of young of the year have been seen making abortive attempts at nest building. This suggestion — the effect of warm weather on the nesting instinct, is made more probable by the actions of the birds during warm spells in mid-winter, when the males begin to sing vigorously, the song

exhibiting many easily recognizable nuptial characters — all these indications of the awakening of the nesting instinct are at once silenced if cold weather supervene. Cold weather has a positive deterrent effect on egg laying, a fact clearly established by the writer's records. On the other hand pairs of House Finches, unquestionably mated, have been observed looking for eligible nesting sites in every month of the year, not excepting the period from September to February. The earliest active nest building noted by the writer was on January 30, and the latest July 23; while pairs have been noticed gathering material as late as December 22, these attempts have been classed, however, by the writer as due to a fleeting spell of warm weather.

The birds grow very tame if the nest be closely associated with man and his doings: they seem to be bothered in no way by slamming of doors or by passers in and out of a door close to a nest. The nest is a shallow cup-shaped affair, roughly about four to five inches in diameter, which varies, however, according to the space in which it is built, and has a depth within its cupping of from two to two and a half inches. If built in a box it never completely fills the whole of the floor space unless the box be very small otherwise the nest will be of the usual diameter, and placed, in the majority of cases, in the end of the box farthest away from the light. The materials used in nest building vary according to location: one found in the business district was made entirely of dried freshly cut grass, evidently gathered from the lawns surrounding the municipal buildings, and had a lining of cotton batting. Another nest from the business district was made of rootlets, cow hair, and also lined with cotton batting.

Nests found in the outskirts of the city have the outer portion made of straw, hair, string, small twigs, weed branches, grass and rootlets, and have as a lining some good non-conductor of heat, *i. e.*, cotton wool or string. One nest was built over a large mass of wool which seemed to have attracted some variety of fly, which later had deposited its eggs in the wool, producing maggots that did not bother, so far as one could determine, the young finches growing above them.

One can expedite and encourage the nest building by putting fine straw or dry grass in the nesting box, arranging the material

roughly in the shape of a nest just begun. The first nests of the year are usually built very slowly, three to six days being consumed in the work, which is done wholly by the female, though the male often brings pieces of nest material, which are, however, never accepted by his mate. This performance of the male always impresses one as being a 'bluff.' He dances constant attendance on the female as she works, cheering her continually with vigorous song, at its best at this time. Later in the season a nest, if it be what one may term 'an emergency nest,' may be completed in a single day, and an egg laid in it on the second day.

After a nest is finished, if it be not an 'emergency nest,' the builders almost invariably leave the neighborhood and are not seen again for a few days, at the end of which absence they reappear, and egg laying begins. If the birds be undisturbed, and the old nest left *in situ*, it may be used to rear a second brood, without its being renovated in the least; but this use of an old nest is not usual. More often an old nest, if used for a second time, is partly covered by a new one, to avoid, it may be, insects, or the soiled condition of the old one. In only one instance has the writer seen the same nest used for three successive broods. On several occasions a new nest has been built over an old one, in which there were abandoned eggs: whether or not the builders of the first and second nests were the same birds, the writer is unable to say. Vigorous nest building begins early in March, unless the weather is too severe. The earliest date on which a completed nest, with an egg in it, has been noted was March 12, though there were many nearly completed nests in the same neighborhood on the same date, or earlier. By the last of March, nesting is in full swing all over the city, but the flood tide of nidification is in April and May (taking the egg laying as an index), there being little difference between these two months, as the following table will show, the data being from the nests about the writer's home premises:—

TABLE NO. 1.

Number of nests completed and containing at least one egg.

	1906	1907	1908	1909	1910	Total
March	—	2	2	2	2	8
April	—	4	9	0	5	18
May	2	5	6	4	2	19
June	3	3	3	2	2	13
July	2	1	2	3	0	8
Unrecorded	1	1	0	0	0	2
Total	8	16	22	11	11	68

The materials used in nest building are not always gathered in the neighborhood of the nest, for the females often go considerable distances for nesting stuff, though suitable material could be gathered closer at hand.

The chances are that a pair uses an old nest more than once, though this is not easy to determine, simple as it might seem. One pair, the female of which had a white feather in its tail, selected a new site for their second, and also for their third brood, which establishes, in any event, that this easily identified pair did *not* use the old nests for new broods.

On several occasions, when English Sparrows have so harried a pair of Finches as to stop incubation before the writer could dispose of the invaders, the same Finches, presumably, have built a second nest over the first one and its eggs; that, however, the builders of the first and second nests were identical, the writer has never been able to determine beyond doubt. Four attempts, extending over a period of sixteen weeks, at nest building in the same box were observed by the writer in 1908, the birds seemingly being identical in all four attempts, but not identified with certainty. One and the same pair, identified positively, has been detected building in one box for a while, only to stop and begin anew in another; probably due to interference by English Sparrows.

EGGS.

The average number of eggs in a set estimated on sixty-six sets, having a total of two hundred and eighty-one eggs, is four plus, the largest being seven, and the smallest two, the latter however may not have been a completed set, though it went on to full incubation. In emergency sets, *i. e.*, complements of eggs laid after a previous set had been destroyed by English Sparrows or storms, smaller numbers prevail.

The average weight of a first egg was found to be 36 grains (13 weights averaged), the extremes of weights being 32 grains and 40 grains. Some sets are extremely variable in the weight of the eggs therein, one set of four eggs giving weights of 32, 33, 35 and 35 grains, while another complement of eggs weighed 35, 35, 35, 35 and 36 grains respectively. The average length was .77 inch, and the diameter .54 inch, the extremes in length being .81 inch for the maximum and .68 inch for the minimum, while the extremes in diameter were .57 and .51 inch respectively.

The earliest date on which an egg has been detected in a nest was March 12, and the latest (counting the date on which the egg was laid) was July 27.

After a female begins to lay, one egg is laid each day until a set is completed. It is quite rare that the daily eruption of an egg is disturbed or intermitted; in 68 sets recorded during five years there have been but two in which this orderly succession of an egg a day has not obtained, and it is quite possible that on one of these occasions the interruption was due to the sudden onset of extremely cold weather. So far as the writer has been able to determine, the eggs are always laid at night, *i. e.*, between the hours of 7 P. M. and 7 A. M., many nests having been examined repeatedly at short intervals during the day with special reference to this particular point.

With the larger sets (five or more), one often finds an egg outside the nest, presumably accidentally crowded out, because of lack of room. Several times infertile or undeveloped eggs have been found in the box outside the nest, the other eggs of the set having gone to successful incubation. Whether the old or young birds have accidentally pushed out such eggs, as they move about in the nest

is not determinable. The writer suspects that the old birds may remove from the nest, eggs which have failed to hatch, because such eggs have frequently disappeared when the nest has in no way been disturbed by English Sparrows, which would be the only other cause in explanation of this disappearance.

The female has a peculiar and unmistakable cry when laying, a call which is answered promptly by her mate. The writer has frequently been led to discover new sets of eggs in a nest through hearing this peculiar 'egg cry' of the laying female. The female also calls to her mate in a different, yet characteristic, way when incubating. She is then often fed by the male, the feeding being precisely similar to the feeding of a young bird, even to the fluttering of wings, etc.

The average length of incubation is fourteen days: occasionally it may be a few hours or even a day shorter, but more frequently it is longer. In one set the first egg laid apparently took fifteen days to hatch, and the fourth egg seventeen days, the other two eggs of this set being failures, one from infertility, and one dried after being partly developed.

It is somewhat difficult, in studying the incubation period, to estimate the amount of incubation effected by the laying female. In some sets the first egg laid can be seen to be partly incubated before the whole set is completed, taking the newly formed red blood channels which show clearly through the shell in the developing ovum as an index of incubation. This may, and probably does, explain the irregularity which has frequently been noticed in the hatching of a set of eggs; almost every possible combination of hatching having been noted — all on the same day, though this is not common; two on one day and the remainder at regular intervals etc., etc. The female, while incubating, has been seen during daylight asleep on the nest. The eggs sometimes undergo a surprising amount of cooling without being spoiled. One set, when partly incubated, was successfully hatched after being uncovered all of a cold rainy night, the female having been frightened from the nest at about 11 P. M., not returning until daylight. Several sets have been hatched despite the occurrence of several snow storms during incubation. An attempt was made, several times, to mark and number each egg as laid, in the end to determine

which egg was hatched first, but each effort, except one, was a failure because the pencil marks became blurred or effaced by the rolling of the eggs in the nest as the setting female moved about.

This method of investigation, by marking the eggs, has not been pushed as far as might have been possible, because of the fear of breaking the eggs, which accident happened once in the early attempts at marking. The writer has also been unable to determine whether the largest or the smallest egg hatched first, or whether the size of the egg bore any relation to the length of incubation. In the single exception mentioned above, the egg laid first, hatched first. It is possible that the eggs, as laid, could be colored by aniline dyes, and thus be distinguishable one from the other; but this method was not used through the fear that the dyes might be detrimental to the development of the eggs. Only once, during five years of systematic observation on 68 nests, have empty egg shells been found in a nest, an observation which may reasonably be held to show that the old birds remove the empty egg shells, as they do the fecal sacs during the first days after the eggs are hatched. Two broods are probably raised each summer, and, on one occasion at least, three were raised by the same female.

The record of this particular female is interesting: the first egg of brood No. 1 was laid May 14, of brood No. 2, June 23, and of brood No. 3, July 9. In brood No. 1 there were five eggs, in brood No. 2, four eggs, and in brood No. 3, three eggs, this diminuendo scale meaning, perhaps, a gradual slowing of the ovarian energy for that year. Of these twelve eggs, one was infertile, seven were hatched successfully, and the nestlings left the nest in due season; and though the four of the second set were hatched successfully, English Sparrows raided the nest, and killed all the nestlings when they were two days old. It is highly probable that this female was stimulated to raise a third brood by the early loss of the second one.

INFERTILE EGGS.

The number of infertile eggs out of a grand total of 283, was 25, a percentage of infertility of about 9. It is rather difficult to establish a certain index of infertility, and, to be safe, the writer considered as infertile only such as could not have been chilled, or such

as failed to hatch when others in the same nest were successfully incubated. All eggs which failed to hatch were examined to determine if any development had occurred, and when any least trace was found, such egg was not counted as infertile. The infertility varied considerably from year to year as the following table will show:

TABLE NO. 2.

	1906	1907	1908	1909	1910	Total
Sterile eggs	1	8	3	9	4	25
Total laid	33	64	87	52	47	283

The male feeds the young for a considerable period after they leave the nest, often so long that he will also be feeding at the same time the young of a second brood. The female is most devoted to her nest, leaving it with extreme reluctance, and returning as soon as an alarming disturbance ceases. The nest is kept under close surveillance, and a female may even show signs of anxiety if an empty nest (after the young have flown) be examined. The incubating bird will stay on a nest under very distressing conditions, *i. e.*, during a severe snow storm; and on one occasion a female was noticed brooding a nest full of young which had frozen during the previous night.

FEATHERS.

The feather development and growth occur with amazing rapidity, even twenty-four hours making surprising changes, especially during the first few days after hatching. The appearance and growth of the various feather tracts differ, apparently, in different broods and individuals. It is approximately as follows:—the young up to the fourth day seem naked, but are really partly covered by a minute down which appears in streaks, there being four lines on the head, *i. e.*, one along the skull in the long axis of the body, one over each eye, and one over the occiput, transverse to the long

axis of the head. There is also one along the dorsum of each wing, one over each scapula parallel with the vertebral column, an inter-acetabular dorsal patch, a streak down the outside of each thigh, and a sternal streak which bifurcates, one fork going under each wing, and on the second day an interscapular vertebral streak appears. All these areas grow rapidly and soon appear to coalesce; and by the fourth day the body seems to be covered all over with down, except the belly, and, by this time, the wing quills are just budding. On the fifth day, the wing quills are one eighth of an inch long, while the back and side streaks of down show a stubby growth of feather tubes. The wing quills, on the sixth day, are three-eighths of an inch long, the tail feathers are one quarter of an inch long, and the back and neck stubs are now clearly distinguishable as feathers. On the seventh day, the wing feathers are five eighths of an inch long, but are not wholly delivered from their casings, and the shoulder stripes show as true feathers. On this day, the wing, tail and back feathers are long enough to be preened by the young bird. On the ninth day, the back is entirely covered by true feathers; and on the twelfth day, the whole bird appears feathered as an adult, with, however, this difference, that a good deal of the original down persists, and stands out beyond the true feathers, most noticeably on the head. It was of especial interest to the writer, while taking notes on the feathers of this bird, to see how slowly and how late the head became covered, a condition which may perhaps be taken as a tendency to persistence of the primitive avian pterylosis, in which the head was long naked. (Scott — *Introduction to Geology*, p. 698.)

NESTLINGS.

The young remain about fourteen days in the nest, which is kept perfectly clean by the old birds for four or five days after the eggs are hatched.

When the young birds have developed enough to voluntarily move about, and arrange themselves in the nest, which usually is about the fifth day after hatching, the nest edge then exhibits the first signs of fecal soiling, which comes about in a manner common

to many other nestlings, that is to say, the young birds void backward over the nest edge, after each feeding, leaving the nest centre unsoiled. The young are fed by the parent bird during the whole of nest life by regurgitation. If the season be that of dandelion seeding, which in Denver is a continuous performance from April to November, the crops of the nestlings are seen to be full of dandelion seeds. When the nestlings are very young (one to three days old) the regurgitation act of the parent is very prolonged; indeed it is very much longer at this time than when the young are more fully developed. Both old birds share the work of feeding the young, and the intervals between the feeding are comparatively long, much longer than with nestlings fed on animal food, as a Robin, for example.

An interval of fifteen or twenty-five minutes between feeding visits by the old birds to the nest is not at all unusual. This may be due to the obvious fact that it takes longer to gather a crop full of seeds than it does to get a bill full of worms. The old bird invariably goes to the drinking dish for water, immediately after feeding the young. Different pairs vary very much in their attentions to the young and it is noticeable that the old birds are less assiduous in feeding the young toward the time when they ought to leave the nest, a neglect which may tend to *make* the nestling venturesome and leave the nest. The newly hatched birds make no noise, and not until about the third day can one detect any sound coming from them; and then it is but a faint peeping, which, however, rapidly increases in vigor and strength, so that on the seventh day in the nest, the young birds make considerable noise when the old birds visit them. If a bird only twenty-four hours old be placed outside the nest, it will crawl about using its wings as a pair of anterior legs and a nestling three days old will, if placed on the nest edge, crawl back into the nest, and arrange itself according to a fixed way, rump in, and bill extending toward or on the edge of the nest. The young preen themselves quite early during nest life, as they have been seen arranging and cleaning their feathers when seven days old. During the first three days after being hatched, the young *seem* to have closed eyelids, but a close and careful scrutiny reveals a narrow slit through which the birds probably notice their surroundings.

Not infrequently a very small nestling (*i. e.* 24 hours old) has been found uninjured outside the nest proper, it is possible that the old bird in trying to remove egg shells may have pulled the little bird out of the nest.

The old birds remove the fecal sacs as they are voided by the young after each feeding, up to the fifth day, the nest remaining perfectly clean during all these days. From this time on the nest edge becomes progressively more and more encrusted with the fecal sacs which are voided by the nestlings over or on the nest edge. If the nestling be taken from the nest and fed by hand, an excremental sac is voided at once after the food is swallowed, the bird backing as though going to the nest edge, the action impressing one as being due to an irresistible impulse. One can see at once, from the soiled edge of a nest, if it has sheltered a successfully raised brood. On several occasions one of a brood has died in the nest, and afterward disappeared. It is assumed by the writer that the old birds have thrown out the dead one, but he has never been able to verify this assumption; on the other hand, dead nestlings have been found mummified in a nest in which the others of the brood have gone to full development.

The nestling is able to hold up its head and open its mouth as soon as it is free from the egg and dry. It can squirm about with considerable force within two hours after hatching, and when two days old will *crawl* feebly about and try to place its head well up on the nest edge. When eight days old, the young ones are attentive, vigorous and alert, but not yet timid, and if the nest be taken down for examination the little birds will squeak and open their mouths to be fed. If lifted from the nest at this period, they cling most tenaciously to it with the feet, and when put in the scale pan to be weighed, they are very active and crawl about in a lively manner.

At this time, too, they arrange themselves very definitely in the nest, each seemingly having its place, and each tries at once, if disturbed, to get to its place and rest its bill on the nest rim. On the tenth day, they seem 'conscious' of their surroundings, appear to be 'studying' the nest, and each other, and have acquired a noticeable degree of timidity. From this time until the nest is deserted, they move about in it, mounting to the edge where they frequently stand and energetically use the wings in a fanning man-

ner, an 'exercise' which undoubtedly leads to growth and development of the great pectorals. Many can fly well on the twelfth, and some leave the nest on the thirteenth day, though the time of leaving the nest is quite irregular. All may leave on the same day, which is most commonly the fourteenth, yet some remain in the nest until the sixteenth day after hatching. One finds almost invariably, in a large brood of five or six, that one or two of the birds have gotten a good start on the others through having been hatched earlier, and that such birds fly before the others do.

Without an exception, the writer has found that the nestling's note changes, a day or so before its first flight, from the peeping sound characteristic during nest life, to the cry of a young bird able to follow its parents, and the writer has been warned a number of times by this unmistakable change in note, that some of the young in his nesting boxes were ready to leave them.

About this time also, the young birds take instant heed of the old bird's cry of warning, if danger be near. The first flight is frequently a long and vigorous one, many nestlings having been seen to leave the nest and at once fly two hundred feet to a tree or house. Several times when this has occurred the little one has been accompanied in its initial flight by the parents, both old birds flying as close to it as possible. Contrary-wise, many times these nestlings on the first attempt at flight will drop to the ground. Under such circumstances they crawl into corners, or under bushes, or amongst leaves. How they there escape the ubiquitous cat is hard to understand, yet they do, and one can watch them about one's yard gaining strength and self-reliance from day to day. They always try, by climbing, to get as far from the ground as possible and by dint of short jumps and flights, mount from ground to bush, bush to fence, and fence to tree, where, once well established, they remain several days, being fed regularly by the old birds. It is astonishing how much cold and exposure, soaking by rains and wet snows, these young birds will stand. The mortality is very great, however, after such exposure, especially if it comes soon after they leave the nest. Many perish, too, by hail storms.

When one can study daily several developing broods of House Finches, the individuality displayed by particular nestlings is

startling: one, for example, will early show a tendency to be a 'fighter,' resisting handling, and pecking one's hand, while all the rest in the brood may be quite submissive. The color-identification scheme, hereinafter to be described, often permits one to follow and study a certain bird for some days after it leaves the nest, and has made it possible to ascertain that the young birds feed themselves at least as early as seven days after leaving the nest, though at this time they still follow the parents about, begging most persistently to be fed. Hence it follows that, if a young bird were thrown wholly on its own resources at this time, only five weeks would have elapsed from the laying of the egg until the embryo had become fully grown and able to shift for itself, this period of five weeks including two weeks of incubation, two weeks of nest life, and one week of post-nest life. It is surprising how large a number of broods will take just about this period for all their members to mature and shift for themselves. The progress of these events seems swift to the writer, inasmuch as the House Finch cannot be considered in any way precocious.

It has seemed to the writer that those birds hatched last in the brood are not so vigorous as those out first; it is possible that this notion may have arisen in the writer's mind because the first hatched have a considerable start in growth and vigor by the time the last ones break through the shells. This notion is not supported by the data accumulated by weighing the developing nestlings, if weight be taken as a criterion of vigor.

The combination of cold and wet is most disastrous to the young, and the writer has often put them from the ground into bushes during cold rainy nights, covering the overhanging branches with newspapers, giving him the satisfaction of saving several young birds, while those not covered have perished. The young soon learn where the food trays are located and go to them often, stuffing themselves to repletion.

There is a great deal of difference in the color pattern of the young birds in a given brood, one having the breast and belly markedly streaked with blackish, while in another these areas are almost pure grayish. The back may exhibit parallel variations. Once all the young in a nest of four were thrown out of it by English Sparrows; three had died before being discovered, but the fourth

seemed to recover fully on being warmed and sheltered. It was put into another nest, the young of which were of almost identical age with it, in the hope that it might be adopted and fed by the old birds of the second nest. They, however, paid absolutely no attention to it and it perished. The young of the year are often, by September, distinctly reddish on head and throat and if we assume such birds to have been hatched in the previous April, it becomes apparent that this secondary sexual character appears within the first six months of life.

SPECIAL DETAIL STUDY.

Comparative physiology is of interest and importance both to the biologist and to the zoologist. With a desire to furnish data to both, and in the end that some light might be shed on the nutritional processes of developing young birds in a wild state, a scheme of weighing young House Finches from day to day was undertaken by the writer. There are in the literature of ornithology records on the weight of young birds, the daily gain in weight of such young birds, and the amount of food consumed by them — facts appertaining especially to young Robins in captivity; but there are no such facts known to the writer relating to free wild birds. In order to learn something concerning the weight of a fresh laid egg, the weight of its embryo on hatching, the daily gain in weight of a nestling, the weight of the same bird on leaving its nest, and, finally, the weight of an adult bird of the same species, the writer carried out an interesting study bearing on these points.

With House Finches nesting in boxes, as described above, it is extremely easy to take a nest once a day, into one's house, and examine or weigh the eggs or young, without in the least interfering with the regular process of incubation or feeding.

In order to identify each bird in a particular nest, each one was marked somewhat as follows:—by using aniline dyes dissolved in alcohol such birds could be colored in areas, on parts, and with such colors, as one desired; for red, fuchsin, and for blue, methylene blue was used. These dyes are readily soluble in alcohol, which quickly evaporates when applied to the young bird, and does

the bird no harm. The first bird hatched had its right thigh and side colored red, one or two applications sufficing for the whole period of nest life: the second bird had its left thigh and side stained blue, the third its right thigh and side stained red, and its left thigh and side blue, and so on.

Combinations of parts and colors numerous enough to identify several birds will readily suggest themselves to the reader. The plan worked admirably, and made it possible for the writer to follow a young bird's career from its 'hatching' until some time after it left the nest. In determining the weight of egg or bird, it was placed in the pan of an accurate balance, and the weight recorded in grains (avoirdupois). Grain weights were used, not through choice, but because they are most familiar to English readers, and most easily carried in mind by them. We have already seen that the average egg weight is 36 grains, and that the extremes were 32 and 40 respectively. It then became necessary to secure the weights of adult males and females for purposes of comparison: the only ways to learn these weights were, either to catch parent birds which were nesting about the house, obviously interfering with the study of the young in the nest, or to kill old birds known not to belong to a box nest; and the writer was unwilling to employ either of these means. Fortunately, however, an adult female, known not to belong to a box nest was caught by accident, and was found to weigh 289 grains, which is the only datum in the writer's possession to use as an adult normal. One young bird, able to fly well, was caught on the premises, and, on examination, proved not to have come from any of the study nests. It weighed 259 grains. Before it was liberated, its breast was marked with bright red, through which characteristic it was afterwards easily recognized. It lingered about the premises for over three weeks.

Two nests of young House Finches, both sets of eggs hatching almost simultaneously, were selected and studied as to the initial, the daily gain in, and the final weight of their nestlings. The following table gives the data thus obtained, together with the meteorologic conditions prevailing during the period of study:

TABLE No. 3.

Weight each day (in grains) of nestlings.

Nest	Bird	June, 1907.																	
	May 31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
"4-B-07"	No.																		
	1	35	46	62	74	109	136	154	188	211	216	237	238	257	261	248	249	*	
	2	43	50	75	84	134	158	188	212	235	240	249	252	263	258	*	—	—	
	3	—	39	36	73	107	130	153	188	213	221	238	243	260	263	255	249	*	
"5-C-07"	4	—	—	34	45	60	74	95	120	156	163	187	198	227	238	235	239	242	
	1	30	45	68	92	126	160	185	216	241	255	272	278	279	286	*	—	—	
	2	43	69	93	121	160	186	209	228	254	270	265	265	267	273	*	—	—	
	3	49	75	107	132	169	201	220	234	250	263	248	258	265	264	268	—	—	
Daily Temperature	4	63	94	120	148	190	209	239	249	257	270	268	263	260	272	*	—	—	
	Max.	—	75°	73	71	74	75	76	71	68	75	83	85	84	86	87	70	76	72
	Min.	—	48°	46	44	48	50	47	49	45	54	50	50	52	52	57	55	52	53
	%	—	64	77	80	63	85	83	51	69	100	85	100	91	99	100	77	80	82
Sunshine	Precipitation	In.	.83	T**	0	01	.01	T	.12	0	0	T	0	0	0	0	0	0	0

Note:— Weight of eggs — nest "4-B-07"—35, 35, 35, and 36 grs. (one infertile)

— nest "5-C-07"—37, 38, 39 and 40 grains each.

Relation of weight of nestling to egg not determined.

* = Left nest.

** "T" meaning trace of precipitation.

This table of weights is of considerable interest, and, it is hoped, also of value as establishing, with these eight nestlings, a provisional curve of weights for growing House Finches. It will be seen that the least weight, at hatching, was 30 grains, and the greatest 63 grains. This wide variation *may* be explained on the assumption that the high weight was partly due to this nestling's having been fed by the old birds prior to the weighing. If we assume that the egg is hatched at night, which seems always to have been the case in the writer's experience, it is probable that the incubating female fed the young bird during the night, or shortly after dawn, both periods being before the writer took the daily weights (*viz.*, 8 A. M. each day) and one or two feedings will materially increase a very young nestling's weight.

The average initial weight of eight nestlings was 42 grains, and the average last weight (before flight) was 262 grains. If taken by broods this last average was 249 grains, and 275 grains (disregarding fractions), extremes which show considerable divergence, a difference which might almost be predicted *a priori*, when one recalls the marked difference existing between pairs of parent birds in their attention to the young. A number of other young birds have been weighed, these young House Finches having been caught about the writer's premises, and in neighboring yards, and identified as not being from nests Nos. 4 and 5. Of these young birds, two were from a nest which was attended by two old birds noticeably careless in their attentions to the young. It was apparent for days that they paid unusually infrequent visits to the nest; the two nestlings in it, on the last weighing, were found to be far below the average, one standing at 181 grains, and the other at 209 grains. Including these two obviously under weights, the average weight, determined from eleven birds able to leave the nest (not including birds from nests Nos. 4 and 5) was 250 grains. Excluding the manifestly underweight nestlings, the average of the remaining nine was 262, an interesting correspondence to the similar weight averaged from the nestlings of nests Nos. 4 and 5. The weights from nests 4 and 5 show that a House Finch will grow to within 92% (or more) of the adult weight before it is three weeks old, which, is a surprisingly rapid growth. The extremely low weight (181 grains) exhibited by one nestling able to leave the nest proves

that a young bird attaining but 62 % of its normal weight can shift for itself, or can, at least, try to do so. On the other hand, one nestling in "nest 5-C-07" reached within thirteen days after hatching 99 % of the adult weight (viz., 289 grains: 286 grains). Brood "4-B-07" shows us that a bird may be hatched two days before another and yet weigh when leaving the nest but 3% more than does the latter, an observation which seems to point to the fact that various members of a brood follow very closely a certain level of growth and this level of growth is also shown by the weights of each bird in relation to the weights of the others, when all left the nest.

There is, however, a noticeable difference in the "flight weights" of the members of brood "5-C-07," though it appears small when expressed in percentages, *i. e.*, 6 % between the heaviest and lightest (286:268). It is to be noted that this difference occurred in the birds of brood "5-C-07" notwithstanding that all four birds were hatched within twenty-four hours; and the weights of the various eggs in this nest were too close to each other to presuppose a better start for any given ovum because of greater egg weight.

Toward the close of nest life some birds lose in weight, which may be, and probably is, due to the parents' slacking up on feeding, in their efforts to coax the nestlings to fly. A loss in weight may be due, in some instances, to an alvine discharge having occurred just before the bird was weighed, an incident noted several times during this study. Such a discharge may amount to 5 grains, actual weight.

The following percent gain curve shows, as one would expect, a very large percentage gain in weight during the first days of nest life, the gain then going on a diminuendo scale to zero, or even to a loss. It is surprising to learn that a nestling may gain 60 % in weight in twenty-four hours.

A singular feature shown by the percent gain curve is the spurt upward shown on the fourth day, the mean of the eight birds in broods "4-B-07" and "5-C-07" showing this spurt unmistakably. It is highly possible that this peculiarity in the weight gain would not obtain in a large series of weighing. The writer was unable to determine whether a larger egg gives its embryo a better start than does a small egg its embryo. The weights of these eight nestlings

seem to show that the method of obtaining them had no untoward effect on the growth of the birds. The meteorologic conditions prevailing during the nest life of broods "4-B-07" and "5-C-07"

TABLE No. 4.

Average daily gain in weight of eight nestlings, gain given in percent.



seemed to have little or no influence on the development of the individuals of both broods, though the temperature went, on several nights, below 50 F.

CONCLUSIONS AS TO WEIGHT.

1. Average weight of House Finch egg — 36 grains.
2. Average weight of newly hatched House Finch — 42 grains.
3. Average weight of young House Finch on leaving nest, 262 grains.
4. Weight of an adult House Finch — 289 grains.
5. Average weight of 17 House Finches (juv.) was 92 % of adult bird's weight.
6. A young House Finch when leaving the nest may weigh within 99 % of the adult weight.

7. A young House Finch may weigh 99 % of adult weight within two weeks after hatching.

8. A young House Finch may weigh only 62 % of adult weight yet be at large and able to fly about.

9. The House Finch nestlings may lose in weight just before leaving the nest.

PARASITES.

The young and the nests of the House Finch are always infected by a minute parasite, some of which were collected and sent to an entomologist, who determined that they were not true bird lice (Mallophaga) but mites, probably belonging to the family Gamasidæ, subfamily Dermanyssidæ. Further than this, no study of the House Finches' dermal parasites has been made.

ALBINO HOUSE FINCH.

On March 12, 1907, the writer and his family observed a snow white House Finch, which was evidently a female as it was plainly mated to a normal male which accompanied it. This albino was entirely white except a suspicion of dusky encircling the base of both mandibles. Another albino female House Finch was seen the next year in a neighbor's yard. It was assumed to be the one observed the previous year.

INJURIES.

The propinquity of this species at the office and house has permitted such close observation that many of these bird visitors have become known by deformities which they had sustained from injuries; a surprisingly large number of crippled House Finches has been noted, none of which seemed to be any the worse for its handicap. Eleven crippled House Finches exhibited the following mutilations or deformities:

- 1 ♂ Right foot missing.
- 1 ♀ Right leg missing,
- 1 ♂ " " "
- 2 ♂♂ Left " "
- 1 ♀ One foot and one-half of tarsus missing.

- 1 ♀ Left tarsus and foot crippled and drawn up.
- 1 ♂ Right foot permanently doubled up.
- 1 ♂ Left leg paralyzed.
- 1 ♀ With crooked leg,
- 1 ♂ Right tarsus bent.

Every one of these aforesaid birds was well nourished, and seemingly quite able to care for itself. Those with but one leg were a little awkward in perching on the drinking dish, or food tray, as were also those with markedly deformed legs or feet. One with but one half a tarsus on one side used it as a stump, and did so with ease and agility. It is rather difficult to explain these mutilations; the most reasonable explanation being that the missing members were lost by being frozen. In extremely cold weather this species does suffer from cold feet, and it has frequently been seen standing on one foot while warming the other drawn up in its feathers. These crippled birds prove that considerable mutilation may occur with a wild House Finch, without soon eliminating it in the struggle for existence.

MORTALITY.

The following tabulation shows the ultimate fate of all the eggs laid in the nests under observation:

TABLE NO. 5.

Result	Cause of loss: — By					Young fly	Total
	Freezing	English Sparrows	Accidents to nest	Entangled in nest	Eggs infertile		
Year							
1906	0	6	4	0	1	22	33
1907	13	2	2	1	8	38	64
1908	15	18	5	0	3	46	87
1909	1	9	4	0	9	29	52
1910	0	10	2	0	4	31	47
Total	29	45	17	1	25	166	283
%	10%	16%	—6%—		9%	59%	

Counting fertile eggs and hatched young as potential additions to our House Finch population, we find that the mortality is very large with this species, even if estimated only to include the first four weeks after the eggs are laid.

Over forty percent of the eggs laid were ultimate failures, the largest factor in the loss being destruction of the eggs and young by the English Sparrow, a condition to be considered shortly. About ten percent loss is caused by late spring storms, climatic conditions lasting but a short time, yet long enough to cause that much loss. There are a few minor accidents which have been recorded during this study: thus one nestling perished because it could not be, or was not, freed from the sticky egg shell; another became entangled in the fibrous nesting material, and, unable to leave the nest when full grown, was abandoned by the old birds; once a box was blown down and the eggs destroyed by the fall. One young bird, recognized by its brass anklet, was found crushed in the street the same day it left the nest.

ENGLISH SPARROW *vs.* HOUSE FINCH.

There remains at least one point in the data accumulated during this study of the House Finch, which, while not relating wholly to it is of so much importance in relation to its future that it rightfully must be examined here. The question is, namely, the relation of the House Finch to the English Sparrow.

Cooke suggested (*Birds of Colorado*, March, 1897) that this sparrow in its westward march would perhaps "meet its first real foe" in Colorado in the House Finch. The information gathered in this study will shed some light on this question, which must be examined not only concerning the contact of adult forms, but also with regard to the nesting habits, fertility, etc. The relative length of the nesting and breeding periods is of first importance. In Denver English Sparrows are commonly seen fighting each other for nesting sites in November, December and January, and the earliest date when this sparrow has been noticed taking up material for a nest, was January 8, on which date a pair of English Sparrows was seen breeding; and also by this time of the year completed nests have often been observed. While both House Finch and

English Sparrow seem stimulated to mating and nesting by mild warm weather, yet the second species seems much more susceptible to this stimulus, and responds much earlier. At the other extreme of the year parallel conditions obtain: The House Finch has never been seen, by the writer, building a nest or having eggs in one, after August, while the English Sparrow habitually continues egg laying and incubation during this month, in September, and fresh eggs of this species have been taken during the third week in October. It would thus appear that the English Sparrow's season of nidification extends throughout almost the entire year, exceeding that of the House Finch by many weeks. It thus is apparent that the English Sparrow gets its young into the field earlier and during a much longer period than does the House Finch, which, in itself, would almost certainly cause it to win against the House Finch in a struggle between the two species. The male English Sparrow does as much of the nest building as its mate, while the male House Finch does nothing in this way to help its mate, a difference which may hasten and facilitate the completion of an English Sparrow's nest in a shorter time than that of the House Finch.

The Sparrow's large bulky nest, wherever situated, with its usual lining of feathers, is far more resistant to snow or rain than is the open Finch nest, another factor tending to promote the multiplication of the English Sparrow, under conditions in which the young House Finches perish. The English Sparrow's greater adaptability is also in its favor. This flexibility of nesting exhibited by the English Sparrow comes into prominence in its habit, in Denver, of using abandoned nests of Bullock's Oriole (*I. bullocki*) in which to raise its young.

The loss of nests, eggs and young of the House Finch through direct destruction by the English Sparrow is very large. It was 16% in some of the nests studied by the writer, and, moreover, this 16% loss of eggs does **not** include the very large potential loss of House Finch eggs and young brought about by destruction of nests by English Sparrows before the House Finch eggs are laid in them. One should remember also that there must be a loss of House Finches greater than 16% through the English Sparrows when they are not prevented from harassing the House Finch.

Sixteen percent of the eggs and young of the House Finch were lost on the writer's premises through destruction by the English Sparrow, notwithstanding the writer's constant and persistent attempts to destroy the latter species in his neighborhood. The writer has personally witnessed English Sparrows going into the House Finches' nests, and has seen them throw out the young, these nestlings having the heads pecked open by the Sparrows before they were thrown out. The House Finch will often put up a mild fight against the invaders, giving at the same time a very characteristic squeak but the Finch is almost invariably beaten in these battles. In many years' observations on this phase of the Finch question, the writer has but once seen a Finch whip a Sparrow. In the early years of this study, before it was undertaken systematically, the writer lost a great many nests, eggs and young of the House Finch through the depredations of the English Sparrow, and despite many and various schemes to drive away the English Sparrow and help the House Finch, he did not succeed until a powerful air gun was secured, with which the Sparrows were finally decimated in his neighborhood.

The first English Sparrows seen in Denver by the writer were noted at the Union Depot in 1894, and then a few pairs only. Today, the writer believes, there are in this city, estimating along lines similar to those used in estimating the House Finch (comparing numbers for numbers) more than one half a million English Sparrows.

It would thus seem self-evident that this exotic sparrow has flourished in Denver since 1894, and has been in no way prevented by the House Finch from increasing. On the contrary, the evidence gathered by the writer is overwhelming that the English Sparrow overcomes, and is superior to, the House Finch in the biologic struggle. That it is the winner in this fight, many of our citizens realize; but they do not realize that it brings about a retardation of the spread of a native species, whose help to the community as a weed destroyer is of far greater value than is any benefit accruing from the English Sparrow as a scavenger, or through its habit of feeding its nestlings partly on animal food.

BIRD PHOTOGRAPHY BY THE DIRECT COLOR
PROCESS.

BY FRANK OVERTON, M.D. AND FRANCIS HARPER.

MANY photographs that show the home life of wild birds are objects of great interest and beauty, but black and white pictures fail to reveal the most striking of all the characteristics of a bird — its color. Photography affords an almost perfect means of recording other important characteristics, such as size, shape, and habitat; but until recently it has been almost a total failure in recording the color of the plumage.

Hitherto the colors of birds have been represented by means of paintings and their reproductions or by means of hand-colored lantern slides. But bird-painting is an extremely slow and difficult process. The artists who are capable of adequately portraying birds are surprisingly few in number, and to satisfactorily reproduce the paintings on the printed page is almost as difficult as to make the original pictures. Consequently many of the printed pictures in color are merely keys, and few painted portraits, however pleasing their composition, are accurate in every particular. Hand-colored lantern slides are valuable and beautiful, but most of them fail to represent the bird subjects accurately or in desirable detail. Therefore, any additional means of recording vividly and minutely the natural colors of wild birds is worthy of careful study. Such a means is afforded by the use of the Lumière autochrome plates. Photographs taken upon these plates are transparencies, having the qualities of good lantern slides, with the additional quality of showing the colors in their natural tones and in pleasing detail.

An autochrome photograph may be reproduced by engraving and printing in the same way that a painting may be reproduced. But an autochrome is much fuller of microscopic detail than a painting done by hand, and this detail is too fine to be brought out by the engraver's art at the present time. An autochrome, therefore, cannot be reproduced satisfactorily upon the printed page unless it happens to be made up of masses of color without

variegated detail. But an autochrome may be used as a lantern slide, and herein lies its greatest field of usefulness. It is more dense than an ordinary slide, but a good lantern will project an autochrome photograph upon the screen with nearly all the brilliancy that the plate exhibits when held in the hand and looked through by daylight. The colors will be slightly affected by the color of the light in the lantern, but not to a greater degree than the colors of a painting are affected when seen in an artificial light.

An autochrome plate differs from an ordinary photographic plate chiefly in that a single layer of transparent, microscopical starch grains, dyed orange-red, green, and violet, and mixed in even proportion, is interposed between the glass and the sensitive coating or film. This coating is extremely thin, and is made of a panchromatic emulsion. The plate is exposed in the camera with the glass side toward the lens, so that the rays of light must pass through the colored starch grains before reaching the emulsion. Each starch grain is about $\frac{1}{2000}$ of an inch in diameter. An autochrome thus bears some resemblance to a half-tone plate, but the dots upon it are only about one fifth as large as the smallest dots upon the best half-tone plate. The density of the plate is due to the fact that the starch grains intercept a considerable amount of light.

Any plate camera may be used in taking an autochrome, and a special yellow screen, fitted to the lens, is the only extra piece of apparatus needed. If a screen is not used, the photograph will show a dominant purplish tone, owing to the excessive actinism of the violet and blue rays of ordinary light.

The main difficulty of autochrome photography lies in the length of exposure required, which is 100 times as long as is necessary for an ordinary plate. This is owing to the absorption of light rays by the color screen and by the colored starch grains. An autochrome of a wild bird is taken in the same way that an ordinary negative would be made of the same bird, except that the exposure is greatly prolonged. The fastest time in which we have taken a bird autochrome is one quarter of a second, which would correspond to $\frac{1}{400}$ of a second with an ordinary plate. On the other hand, a brooding Blue Jay in a dark thicket has posed for as long as two minutes.

The development of an autochrome is not especially difficult,

although some experience and skill are required to secure the best results. The factorial method of controlled-time development, as described in the directions accompanying the plates, enables one to control the density and contrast of the picture. The image formed by the first development of the plate is reversed in a reducing solution, and the plate is thereby converted from a negative into a positive. The first development, reversal of the image, second development, and washing, may be completed in less than fifteen minutes, and the thin emulsion may be dried in ten minutes more. An autochrome, therefore, possesses a still further advantage over a hand-colored slide in the much shorter time required for its completion.

An autochrome plate is a positive, and no satisfactory method has yet been devised for making colored prints from it directly upon photographic paper. It is well within the bounds of probability, however, that experiments which are now being conducted in this direction may eventually be successful. Fortunately, any number of duplicates may be made by photographing the first plate upon other autochrome plates, in much the same way that lantern slides are made by the use of a camera. The reproduced autochromes are not so brilliant as the originals, but they may be shown with good effect in a lantern.

We have taken several dozen bird autochromes that may be considered successful. The list includes the Laughing Gull, Common Tern, Black Skimmer, Bob-white, Fish Hawk, Flicker, Night-hawk, Blue Jay, Song Sparrow, Purple Martin, Yellow Warbler, Catbird, Brown Thrasher, and Robin. The number of our failures to secure good pictures has not exceeded the number of our successes. Our experience justifies us in stating that the autochrome method of photography affords a practical and definite means of securing brilliant and useful photographs of normal wild birds in their natural haunts, poses, and colors.

CAROLINIAN AVIFAUNA IN NORTHEASTERN IOWA.

BY ALTHEA R. SHERMAN.

THE map of the life zones of North America shows that a northward projection of the Upper Austral Zone extends up the Mississippi River to latitude 44 degrees. The northern boundary of this narrow strip very nearly coincides with that of the so called "driftless area," embracing a territory of 10,000 square miles, which geologists tell us was an island in the sea of ice during the glacial epoch; that through it the Mississippi River flows in the old channel cut by its waters ages before the glaciers came. Here and there, cut out by erosion of wind and water, still stand vast piles of rocks, often of picturesque forms with their ancient pinnacles and bartizans, saved by their insular situation from the grinding forces of the ice. Thus near the river was left a rugged country over which travel is laborious; portions of the woodlands remain in their original wildness in which some of the solitude seeking species of birds still find a home. It is a territory in which ornithological research has been very slight, the workers being too few to make a general survey, yet for future reference notes on the occurrence of southern forms of bird life in this region may be of some value, and it is the purpose of this article to give my note-book records for ten years in this field. For the most part the field of observation lies a few miles on either side of the forty-third parallel of latitude, and extends back a dozen miles or more from the Mississippi River. As stated before the land nearest the river is bluff; the belt of hardwood forest that originally covered it varied in width from five to ten miles, beyond which the country is rolling prairie.

In addition to those species, which in the strictest classification are termed Carolinian, a few words may be in place concerning the abundance of four species that in the Mississippi valley range a hundred miles or more beyond the northern boundary of the Upper Austral Zone. Of these the King Rail, *Rallus elegans*, and the Florida Gallinule, *Gallinula galeata*, are occasionally met. In some years the Grasshopper Sparrow, *Ammodramus savannarum australis*, may be estimated as a tolerably common summer resident,

while in others it is not found at all. Equally variable are the numbers of the Dickcissel, *Spiza americana*, except that this species varies from tolerably common in some years to abundant in others. Misfortune falls heavily upon it; arriving late, incubation is still in progress when the mowing machines begin their work. The first nests having been destroyed the birds leave, there apparently being no attempt made to build second nests.

The summer records for the Red-bellied Woodpecker, *Centurus carolinus*, show that it has been found in every woodland ravine visited, also found on one out of every three visits to its habitat, indicating that it is not a rare summer resident. In April, 1909, I saw one that had wintered on a farm near Steuben, Wisconsin, and the following winter two were boarders at that place. During the past winter in McGregor, Iowa, two Red-bellied Woodpeckers came daily for food to the adjoining yards of Mrs. M. E. Hatch and Mrs. M. A. Jordan.

For the past two seasons the Orchard Oriole, *Icterus spurius*, has not been seen on our place. In 1910 an old male was here on three consecutive days, and the same thing was true for three days in May, 1907. None was seen in 1905, nor in 1906. A female was here one day in May, 1908, and on the 17th of that month a male, wearing the plumage of the second year; appearing again on June 1 was a bird of this description, which remained until the 3rd of July. Very similar were the records for six weeks or more of the presence of a second year male in the spring of 1903, also in that of 1904. Late one summer previous to the decade under consideration a nest was found evidently built by an Orchard Oriole. It was beautifully woven of green grass, which was still quite fresh, but as no eggs were laid in it, nor the owner ever seen near by it was adjudged the "busy work" of an isolate female.

In the past ten years there have been numerous accounts from the Atlantic sea-board and westward of the northern advance of the Cardinal, *Cardinalis cardinalis cardinalis*. Judging from these reports it appears that this northward movement has been all along the line of its range from northern Massachusetts to the Mississippi River. Unfortunately the number of observers in this region is small; if there were more this report of the Cardinal might show that it is of more frequent occurrence.

On April 17, 1908, I saw a pair of Cardinals at the mouth of Sny Magill Creek, both male and female were singing. This creek is a small tributary of the Mississippi River, emptying into that stream six miles below McGregor. Until very recently, I had believed this to have been the first identification of the species in Clayton County. This credit, however, belongs to Mrs. Hatch, who caught a fleeting view of one in McGregor some time prior to this date. In the last week of December, 1908, a male Cardinal appeared at the food table spread for birds in the yard of Mrs. M. A. Jordan of McGregor. It remained as a regular boarder for upward of three months. Barring the brief glimpse of the Cardinal previously mentioned, this bird was of a species never before seen in that place as is established by the testimony of Mrs. Jordan, who had resided there for fifty years, and by that of several other old time residents. Similar testimony came from Blue River, and Boscobel, Wisconsin, villages situated on the banks of the Wisconsin River nearly due east from McGregor; in them for the first time it is said that Cardinals appeared that winter, two spending the cold months in the former place, and in Boscobel one was seen in March of 1909.

In the following winter the species again appeared in new fields. On November 26, 1909, a female Cardinal spent several hours in our yard in National, Iowa. This place has a prairie location, and is on the water shed between the Mississippi and Turkey Rivers; it is the only place outside of bottom lands or near streams from which the species has been reported. Sixteen days later a male came to its former boarding place in McGregor, spending one day there. On February 10, 1910, feeding with the chickens in the yard of Mr. Harry Barnum of St. Olaf, Iowa, was discovered a female Cardinal, the next day a male joined her, the pair remaining until spring weather came; four weeks or more. St. Olaf on a tributary of the Turkey River lies directly west of the mouth of Sny Magill Creek, distant ten miles in an air line. It is the most westerly point in this region from which this species has been reported.

All records for the succeeding two winters were made in McGregor so far as has been learned. In November, 1910 a pair appeared and were seen at intervals during the winter. Late the following

November one Cardinal returned to his old winter quarters, and before many weeks was joined by two females, the trio spending the long cold winter there. Possibly the amount of cold these birds survived was greater than that endured by Cardinals elsewhere. They experienced on twenty-six mornings in the first six weeks of 1912 zero weather or much colder than that, the mercury falling to 38 degrees below zero on two mornings, while 30, 24 and 25 degrees below were marks reached on other mornings, the averages for the twenty-six mornings being 13 degrees below zero. The summer of 1912 is the first summer in which a pair has been in evidence. "We have not missed seeing them for more than two weeks at a time": is the statement of Miss Eva R. Jordan. That the Cardinal is increasing in numbers, and has become a permanent resident seems to have been established beyond question. No nests of the species have been identified. The finding of them, probably, will be by accident, since hereabout the Mississippi is crowded with many islands, offering ideal summer habitats for these birds: places rarely visited by mankind in which search for a nest would make that for the proverbial haystack needle too simple a matter for comparison.

In the wooded ravines in which occur the Red-bellied Woodpeckers is to be found the Louisiana Water Thrush, *Seiurus motacilla*. Wheresoever the swift waters of a brook wash for some distance the base of a well shaded bluff, there in masses of drift-wood may be found nesting a pair or two of this species. Where the forest has been cut away, and thickets of underbrush have sprung up on several occasions I have thought I saw the Yellow-breasted Chat, *Icteria virens virens*, yet always so far away that identification was not positive. It remained for May 7 and 8, 1912, to become red-letter days for the Chat. On those days one was seen in our yard, was viewed through binoculars and without them as it appeared at various times from twelve to twenty feet away. As a species it must be counted quite rare.

Perhaps the northern invasion of the Carolina Wren, *Thryothorus ludovicianus ludovicianus*, has been as great as that of the Cardinal, if so it has not been noted. There is but one positive record for this species. It was on December 2, 1911, in the same yard in McGregor in which the Cardinal appeared, that the Carolina Wren

was first seen by Miss Jordan, and it was viewed for several minutes at very close range by herself and Mrs. Hatch.

Another rare species is the Blue-gray Gnatcatcher, *Poliophtila cærulea cærulea*. An individual of this species was here on August 31, 1908, and for some time was watched through powerful binoculars when no farther distant than twenty to fifty feet.

The last case may possibly be considered by some people as a hypothetical one. It was outside this decade and before the days of the binoculars; but the strange, little, gray bird that through long, hot, August days so constantly sang the unfamiliar notes of 'peto, peto' will always be thought by me to have been a Tufted Titmouse that had wandered north of its customary range.

A DIFFERENT ASPECT OF THE CASE OF ROOSEVELT VS. THAYER.

BY THOMAS BARBOUR.¹

Mr. Francis H. Allen, in 'The Auk' of last October, has published some comments on the 'case of Roosevelt vs. Thayer, with a few independent suggestions on the concealing coloration question.' Mr. Allen's remarks are very unfair to all those who are unable to agree with Mr. Thayer's conclusions. His independent suggestions are, for the most part, unimportant, and add little to the arguments for either side.

In the beginning of Mr. Allen's recent paper, we find ourselves compelled to take issue with him on the question of what is 'common sense.' He says, "In Columbus's day common sense declared the world was flat." This was a dictate of science, and was as worthy of being believed at that time and in that state of knowledge

¹This would probably have been a paper written jointly with Dr. J. C. Phillips had he not left a short time ago for the Sudan. I assume sole responsibility for it, as it stands. A large part is written from notes which we made together some time ago, and for the permission to make free use of these I thank Dr. Phillips very heartily.

as the fact that the world is round is of being believed now. Again "more recently it [common sense] carefully protected the consumptive from 'night air.'" Here Mr. Allen is unfortunately unable to distinguish between superstition and common sense. Some of us have had great-great-grandmothers who were so unfortunate as to have lived in Salem. There they were hanged as witches, and yet this somewhat common practise can hardly be laid to the door of the 'common sense' of those times, but rather to superstition, which is, as yet, often persistent. We absolutely disagree in believing that common sense is "still an obstacle to the spread of scientific education." We consider it science's most powerful ally as superstition is her worst enemy. We agree heartily with what is said regarding the "arrogant attitude he [Thayer] seems to take in regard to the relative claims of the artist and the biologist to be entitled to form an opinion on the subject of coloration,— even more prejudicial, if less irritating, is the — shall I call it cocksure? — way in which mere conjectures are stated as facts." We also agree with Mr. Allen absolutely that a fair attitude towards Mr. Thayer must begin by admitting that he is an expert colorist, and that his perception of color and the value of light and shadow is probably as far ahead of the average scientific person's perception as night is from day; yet we must remember that Mr. Thayer knows nothing of any other than human color perception, and his haphazard assumptions that mammals, birds, reptiles, and insects see in the same way as human beings do, is just what grates most harshly upon the intelligence of the average scientific person.

We read later "I have detected in Roosevelt's paper and the reply to Thayer's criticism, appended thereto, upwards of fifty instances of misquotations, misrepresentations and perversions of Thayer's statements, and pieces of faulty reasoning in matters of detail." These are serious charges, but we must point out that the offences vary greatly in magnitude. It is a great pity that Mr. Allen did not state how many misquotations and how many pieces of 'faulty reasoning in matters of detail' he found. A misquotation would probably be wilful, while a bit of 'faulty reasoning in a matter of detail' might be an instance of where Mr. Roosevelt's opinion was at least worth as much as that of either Mr. Thayer or Mr. Allen.

Later Mr. Allen says, "Then, on page 162 we are told that the

Scissors-tailed Flycatcher is conspicuous in *shape*, but we are not informed, how a bird can be conspicuous in shape." I can answer this question easily by simply stating that a bird can be conspicuous in shape by being like a Scissors-tailed Flycatcher. I strongly mistrust that Mr. Allen has never seen one of these birds in life; their conspicuous shape and their still more conspicuous method of displaying it in their open Plains habitat would have saved Mr. Allen from making such a naive display of his ignorance, had the opportunity for observation ever been presented to him. Mr. Roosevelt is absolutely correct, when he says that the bird is conspicuous 'in color and in habit, has no concealing coloration, and never conceals itself.' Mr. Roosevelt has obviously seen the bird in life. I also have had the good fortune to observe it. This is not a case where Mr. Roosevelt can be called 'stupid.' In a later paragraph we are given another example of 'Roosevelt's dogmatism.' His statement that the typical red fox and the cross fox are 'equally successful in life' is challenged, and we are asked if equally successful, why is not the cross fox as common as the red fox. We can answer that we have no evidence to show that the cross fox is shorter lived, less vigorous, or less well able to catch food than the red fox, or that it is in greater danger from its enemies. The reason why it is less common is purely and simply determined by laws of heredity, which govern the numerical relationship which a 'sport' bears to the parent stock, when no artificial factor steps in and provides for 'sports' only, mating together. We disagree absolutely with Mr. Allen's absurd quibble that "a very little reflection would have shown . . . that no two species ever live under precisely the same conditions." Why not? We believe that very many birds and, indeed, that many animals of all groups live under conditions so near alike that slight differences could not possibly prevent the same biological forces working equally upon all of them. In the matter of color gradation and counter shading, we admit that Mr. Thayer has made great discoveries in optics. Counter shading is certainly not universally existent. Mrs. Barbour, however, has recently called my attention to its frequency among such garden vegetables as melons, cucumbers, gourds and the like and how ineffectually it conceals them. Its effect is certainly destroyed in many in-

stances by an animal's crouching or lying down, but the most important of all seems to be the fact that it does not seem as effective for an animal seen from end view as it is in one seen from the side, and yet, of course, the animal is in as great danger from enemies which may come head on, or from behind, as from those approaching from the side. Mr. Thayer has perhaps never thought of this: Mr. Roosevelt probably has.

Mr. Allen is evidently blessed with that type of mind which wants to see things definitely settled one way or another once and for all. From his writings we presume that he believes that a definite theory is, by the fact of its being definite, worth more than a vague theory. The truism 'I don't know' certainly does not appeal to Mr. Thayer, and apparently it does not to Mr. Allen. Both want to swallow the theory of natural selection reduced to its lowest terms, hook, bait, and sinker, and bring us to believe that this is an universal law, all powerful in its results or effects. No scientific man, or at any rate very, very few, will follow their ridiculously cocksure attitude in regard to this belief. Mr. Thayer's declaration for 'natural selection, pure, simple, and omnipotent' is a dogmatic statement more jarring to scientists in our present incomplete state of knowledge than Mr. Roosevelt's assertions are irritating to Mr. Thayer. Sexual selection is an entirely different problem. It has been observed in actual operation, and if Mr. Thayer cares to study the habits of many birds and animals, he can see it working for himself,—if he is open minded. We believe that coloration is found to be a negligible factor in the life economy of an immense number of species, of which the crow is an excellent example. Keen wits, in this case, make other protection unnecessary. If we mistake not, Darwin has said that sea birds need no protection, hence their conspicuous coloration; and when we are advised to distribute a number of skins of "forest birds and sea birds impartially in the tree tops in some thick wood and see whether there actually is any difference in their conspicuousness or not," we only say that birds of the field or marsh, if put in the forest in some such way as this, would be equally well protected with the forest birds so far as their coloration goes, and that the conspicuous color of the sea bird is well matched by species of the family Cotingidæ which live in the green woods of South America.

We have been advised by Mr. Allen that ridicule is a powerful weapon and sorely as we are tempted, we are trying to keep away from this sharp-cutting blade. When Mr. Allen says, "the fact that Mr. Thayer may have been mistaken in regard to the habitat of the Peacock does not vitiate all of his experiments," he should have added, truly it does not, yet it certainly does *vitate* the one that had to do with *the Peacock*, and this was *all* that we expected it to do. We must take a crack at the now famous Blue Jay, and his shadow on the snow. The jays are a tropical family, species of jays with blue or green coloration occur wide-spread in both tropical and temperate regions. The Florida Blue Jay is almost exactly similar in plumage to the species hereabouts. It lives where there is no snow, as does our Blue Jay a full half of the year. We are frank to admit that our Blue Jays hereabouts do occasionally match the shadows on the snow if seen in exactly the right position, but 'common sense' tells us that this fact has absolutely no biological significance whatever. In regard to the white rump of the deer, I must add just this suggestion to what may be said regarding deer and their enemies. Deer are hunted by wolves more than by other species of animals. Wolves hunt in packs. The deer's white rump might, under certain rather rare circumstances, fool one wolf out of a pack for a short moment during the pack's pursuit. It might at vastly rarer intervals fool all the individuals of the pack were all their eyes at the right level at exactly the right time, but that it could fool all the members of a keen-nosed pack of hungry wolves long enough to allow of the deer's escape is again a matter where I think 'common sense' must certainly be called in. Personally I have experimented with captive deer under wild conditions; *i. e.* in a large park. I have had excellent opportunity for observing them carefully under many conditions with Mr. Thayer's theories in mind. I have also had color varieties of the European fallow deer, which were both counter shaded and solid colored, some pure white, some deep chocolate brown all over, and some with brown backs shading to light bellies. In every case, the solid colored, chocolate brown individuals were the most difficult to see, especially at dusk, the regular time when the wild deer begin to move about and feed. Mr. Allen backs water very hard when he says, of the possibility

that foxes and dogs may locate their prey by scent, that this may militate seriously against Mr. Thayer's contention that the final spring on all occasions is directed by sight alone. I think the important point here really is that we find no evidence that beasts of prey are unable to maintain themselves perfectly successfully in spite of the operation of all these supposedly adverse conditions. If an animal can get all the food it needs, what more does it want? So much for our remarks on Mr. Allen's paper. They are somewhat disjointed and perhaps prolix. We could pick him up on many other points, but this serves to show that his desire to simply bolster up the arguments of a friend would have been more convincing had they been more impartially conceived.

Some time ago, Dr. Phillips and I reviewed Mr. Thayer's book (Auk, April 1911). We put a number of direct questions to Mr. Thayer at that time which we hoped he would answer, both for his own sake and as an evidence to naturalists in general of his sincere desire to really keep this discussion going, to open up the whole matter of coloration so far as possible, to suggest fields of inquiry and experimentation, and not simply to sit down on the top of a heap of facts, which he claims to have discovered and take the attitude that the whole business is settled. Mr. Thayer claims to be interested only in what he terms facts, whys and wherefores receive practically no attention. Franklin did not discover lightning, but he proved its causation through its connection with electrical phenomena, and for that reason became very great. The least increment to our knowledge of how differences are brought about by evolution, actual endeavours to prove experimentally, if possible, the working of evolution relating to the origin of coloration would be worth more than many pages devoted to proving that an oryx's head may be well concealed in a pine tree. Since Mr. Thayer published his book, he has given us a figure (Pop. Sci. Mon., July 1911, p. 21) showing a lion approaching three antelopes uphill. The 'lion's horizon line' and the level of the plains, 'appearing to meet the level of the lion's eye,' make an angle with each other of about 20 degrees, and under these conditions, according to the 'great optical principle' which 'I have discovered' the antelopes are rendered invisible to the lion through their counter shading. Supposing, however, that the

light was coming from the direction of the antelope towards the lion, or that the ground sloped in the opposite direction; i. e. from the lion towards the antelopes, or supposing that the ground was level or undulating, or supposing, again, that the lion was watching for its prey from some eminence, overlooking the feeding ground of the antelopes, then the protecting value of this coloration would be nil. As a matter of fact, lions kill nightly, or whenever they care to. No traveller has ever found them starving to death or unable to provide as much food for themselves and their young as they needed.

The rabbit's greatest enemy in England is the stoat, in New England, the weasel. These enemies hunt by scent alone. They are the only enemies which the rabbits have that would have a visual horizon line low enough for the rabbits white tail etc. to act in an obliterative manner. Every game keeper in England will tell Mr. Thayer, if he asks, that once a stoat takes up a rabbit's trail, the rabbit is absolutely sure to die. Of course, experiments made with dummies and dead skins do not bring out this fact. Using no living animals Mr. Thayer does not realize that color perception and the range of vision vary widely among different organisms. We call his attention to the enormous mass of past and current literature in animal psychology, having to do with experimental work in just such matters as the color perceptions of animals. Could he not correspond with some of these workers, Prof. R. M. Yerkes of Cambridge, for example, to their advantage and to his.

The question is not always are all organisms protectively colored, but do protective colors protect? This, perhaps, is capable of being tested by carefully controlled experiments conducted with living animals under conditions as nearly as possible natural. We do not wish for interpretations in terms of human vision. We do not care to know what is perceptible to the splendidly trained artist but rather what animals themselves see and how other organisms appear to them. So far, our meagre knowledge permits us to say that we have no direct conclusive proof of the efficacy of special coloration. Davenport, in investigating the number of fowls killed by vermin, i. e., weasels, etc. thought that there was the greatest mortality among the solid colored birds, but Pearl, with

a larger set of figures, found that there was no relative immunity among the 'pencilled birds.' In fact, his figures rather favored the solid colored birds.

He shows (*Amer. Naturalist*, Feb. 1911, p. 117) that "ever since the first description made by the Nuremburg miniature painter, Rösel, in 1746 of a case of presumably protective coloration, we have been prone to argue that because an organism was colored or formed in such a way as to be inconspicuous, it was therefore necessarily *protected* from attack by its enemies to a greater or less degree. The logic of such reasoning is flawless; it ought to be protected, but a conclusion may be perfectly logical and still not true. In a study of protective coloration, including mimicry, it is essential that a discovery that an organism is to human eyes inconspicuous, or not readily distinguishable from some other organism, shall not be considered the final goal. Let such a discovery be supplemented by an experimental or observational determination of whether this inconspicuousness really helps the organism in actual practise in avoiding elimination by natural enemies." In many cases we have no theories to substitute for those of Thayer, but we do not hesitate, however, to say that the burden of proof rests on him. The evidence is all against him, though it is for the most part of a negative sort. Meagre and negative as it is, however, it is worth a great deal more than pure, unfounded speculation based upon what is seen by a trained man's eye interpreting animal vision. Thayer's color experiments are not really scientific experiments in any biological sense. They are mathematical demonstrations in human optics, pure physics and nothing else. As aesthetic, physical demonstrations, they are of great interest, but as to their interpretation in terms of the organic universe they are of little interest and of no value. Thayer's point of view is summed up in one sentence of his own words (*Pop. Sci. Monthly*, July 1911, p. 35) "I have been studying for years to find out the exact scene that each costume best represents, and I now beg my readers to come to Monadnock and let me show them the results."

The evidence in Sumner's paper (*Jour. Exp. Zool.* May 20, 1911) regarding the color response of flat fish, when placed on different background both natural and artificial, is a model which Mr. Thayer might well study. Sumner, though he has seen at first

hand perhaps the most remarkable case of protective coloration on record is careful not to generalize or to force on the reader any such protective value to account for the facts. He concludes his discussion by saying that his few statements illustrate the paucity of our direct evidence on the whole question of protective coloration, and remarks that most of our conclusions are entirely of an inferential nature.

The results of Prof. J. Reighard's studies, at the Tortugas Islands, of the coloration of reef-fishes are very important in this connection and worthy of careful examination. Will Mr. Thayer inform us whether or not he has seen this work?

As to mimetic resemblances our best theories have been entirely inferential in nature. We have jumped at conclusions, obvious enough though they seemed at first sight. In his "Darwinism of Today" Kellog calls attention to a case of overspecialization as an argument against natural selection. He describes the well known Kallima butterfly. After showing how unnecessarily perfect the butterfly's resemblance is, he says "When natural selection has got the Kallima along to that highly desirable stage where it is so like a dead leaf in general seeming that every bird sweeping by sees it only as a brown leaf clinging precariously to a half-stripped branch, it was natural selection's bounden duty in conformation with its obligation to its makers to stop the further modifying of the Kallima, and just to hold it up to its hardly won advantage. But what happens, Kallima continues its way, specifically and absurdly dead leaf-wards, until today it is much too fragile a thing to be otherwise than very gingerly handled by its rather anxious foster parents, the Neo-Darwinian selectionists." My own experience has been that Kallima often, perhaps even generally, rests with wings open or fanning.

It seems a pity to return to the case of the zebra. We draw the following conclusions from the observations of careful naturalists:

- I The zebra is one of the most plentiful of all the plains' dwellers.
- II That he and the hartebeests form in many regions almost the sole food of the lions.
- III The lion kills at will and with little effort. This is shown by numberless actual observations.
- IV The zebra shows little concern in the lion's presence. He

feeds down wind to water holes and thick covers, and, in fact, takes not the slightest precaution for his own safety.

These observations seem to be absolutely all that we know regarding the relations which the habits of the lions and the zebras bear to one another. It is hard to fit in any clause relating to protective coloring which would seem to be capable of support by observations, to account for more than the fact that Mr. Thayer has been able to conceal dummy zebras successfully in New Hampshire under various conditions of his own arrangement. We are all mentally prone to inferential methods, this is a common failing of the human mind, and one to which an artist dealing with physical and mechanical phenomena naturally would be very prone. The artist dealing only with the visible and the superficial would naturally turn to the arguments of pure logic rather than to animal experimentation. He lives in an Arcadian land where no conflict of facts or deeply concealed natural laws concern him in the least. The obvious and the all embracing theories are the ones that appeal to him most. We have often pondered on how color patterns may have originated. Mr. Thayer has doubtless done the same thing. His theories demand that we should admit the existence of a constant inter-specific struggle and a selectional value for incomplete color schemes, but we feel grave doubts as to the efficacy of natural selection *alone* in bringing about the species of the present time. Mr. Agassiz often said that natural selection probably explained the survival but not the arrival of species. One cannot account for the arrival of a new organ nor the loss of an old one by Darwinian selection alone. The question of the origin of new characters in general is a problem of the greatest depth and importance, and one that is here out of place, yet how especially difficult is it to imagine with Thayer's reasoning the origin of a new color pattern of doubtful value when complete and of no selectional importance in its elemental state.

We find birds of such varying types of colorations, living under the same conditions as far as the operation of broad selectional principles are concerned, that it is fair to assume that all cannot be equally protected. There are in the upper leaf zones of the tropical forest, birds of which the following are but a few of the colors displayed in their plumages. One may find white birds and black

birds, pink birds, green and yellow, and black and red, and black and green, and magenta birds, sky blue birds and brown birds of many shades, and many with a bewildering number of conspicuous shapes. We use these words advisedly. Can these birds all be equally protected under the same or almost the same conditions? We ask Mr. Thayer frankly to tell us that if such and such types of coloration are concealing as he says they are, are not perhaps such and such other types of coloration equally conspicuous; and then let us see whether in the environment under discussion, we cannot perhaps find these or similar types of coloration displayed by birds apparently as successful as those supposedly protected by coloration. In other words, we ask Mr. Thayer to answer our questions, to meet our arguments fairly and squarely, and not simply to fall back on dogmatic assertions, based upon his interpretation of the physical laws of human optics. It may seem futile to keep bandying words back and forth. The subject is one, however, which is well worth the opening up it is just beginning to receive. We have been severely criticised by Mr. Thayer for our previous review of his work. We hope now that he will come forward and meet our arguments, not with other examples of his own discoveries, but with definite answers to the questions which we have put to him, now and hitherto. Why should flamingoes be pink, if they lack enemies? Why should sea birds be protected when many of them apparently have no enemies at all? How can black birds, white birds, green birds, and brown birds all be equally protected in the same forest by the same light rays filtering through the same green foliage?

7

ON THE GENERIC NAMES *IBIS* LACEPÈDE, AND *EGATHEUS* BILLBERG.

BY GREGORY M. MATHEWS, F. R. S. (Edin.).

WHEN Lönnberg (Journ. für Ornith., 1906, pp. 531-533) introduced Billberg's work to the notice of twentieth century Ornithologists, he showed *Egatheus* Billberg, 1828 was equivalent and anterior to *Plegadis* Kaup, 1829 and should therefore replace the latter.

For a time this was accepted, but when Richmond examined the work he recorded (Proc. U. S. Nat. Mus., Vol. XXXV, p. 607, 1908) that *Egatheus* on tab. A. was a "New name for *Ibis* Lacepède (used for *Tantalus falcinellus* on p. 158)", with a footnote quotation giving Billberg's reason for its introduction: "Dissentientibus auctoribus, quænam esset Egyptiorum *Ibis*; hoc nomen avis in historia insignis justius ut specificum conservari credidimus, adeoque *Egatheum* a græco ἡγάθεος, sacer, prætulimus."

Consequently, *Plegadis* Kaup was continued for *P. falcinellus* by American ornithologists (A. O. U. Check-List, 3rd Ed., p. 92, 1910).

When I made up my 'Reference List' I was not satisfied as to the rights of the cases and allowed the use of *Egatheus* Billberg until such time as I should have occasion to monograph the birds in my 'Birds of Australia.'

However, under date Oct. 3rd, 1912, my friend Dr. Chas. W. Richmond wrote me as follows: "*Egatheus* will never do in place of *Plegadis* Kaup 1829. Billberg used *Egatheus* as a classical substitute name for *Ibis* Lacepède. The name occurs on table A, which is (with tables B & C) designated at the bottom as 'ante pag. 1,' so the contents of the tables are to be dealt with before the body of the work. Billberg did not intend to separate *Egatheus* from *Ibis*, but in the body of the work (p. 158, not 166) he only had the Glossy Ibis to deal with and called it *Egatheus*, because *Ibis* was not classical." This was followed by a letter dated Oct. 5th, 1912: "I think a further note on the subject of *Ibis* Lacepède may be of interest to you, inasmuch as what I wrote you about *Egatheus* did not cover the whole case. I am not able at this moment to clear

it all up, but I think *Ibis* Lacepède will prove to be a synonym of the *Tantalus* of Cuvier's Tabl. Élé., 1798, or in other words will have for its type the *Tantalus ibis*, and thus will replace *Pseudotantalus* Ridgway, and remove *Ibis* from the family of Ibises! This will result as follows:—

Tantalus ibis will become *Ibis ibis*, with *Pseudotantalus* and *Egatheus* as syn.

Ibis aethiopica will become *Threskiornis aeth.*

The family name of the Ibises will become probably *Plegadidae*.

"In Lacepède's Tableaux, 1799, you will find no mention of *Numenius*, but the 'Courlis' group is called *Tantalus*, and the 'Ibis' is given the new generic name *Ibis*. In Cuvier's Leçons, 1800, the 'ibis' is called *Tantalus*, and the 'courlis' *Numenius*. To settle the question it will be necessary, I think, to consult the introductory part of Lacepède's 1799 paper (not accessible here) and see if he did not take his vernacular group names from Cuvier's Tabl. Élé., 1798, also to consult the 'Didot' edition of Buffon (Sherborn knows all about this work) and see if either Lacepède or Daudin did not deal further with *Ibis* there. The Didot edition is not to be had here."

Such an interesting problem deserved immediate attention and herewith are given the results of my investigations.

To deal first with Lacepède's Tableau, 1799. The introduction does not give any clue to the origination of Lacepède's divisions; no references to contemporaries are included. From a comparison of the tables in Cuvier's Leçons, I suggest that Cuvier borrowed from Lacepède, rather than vice versa. The Cuvierian (1800) groups seem to approximate quite closely to the Lacepède (1799) groups and not as closely to the Tabl. Élé. (1798) ones. It seems that Cuvier framed his tables after Lacepède had laid his before the Paris Institute in 1798 (Sherborn, Natural Science, 1899, pp. 406-409), where Cuvier would see them. It does not matter much, however, as there is nothing yet known to decide either way.

In the 'Tableau' the diagnosis of *Ibis* reads "Le bec long, fort, tranchant, et émoussé à son extrémité, des places dénuées de plumes sur la tête."

This is too broad a definition for exact work, so that it is satisfactory to have more data given almost simultaneously by Daudin. An edition of Buffon was apparently printed off by Plassan in 1799 and not issued completely; it was then taken over and issued by Didot. The full history of this complex transaction has been unravelled by Sherborn (*loc. cit.*) and Richmond (Auk, 1899, pp. 325-329; also Auk, 1900, pp. 166-167). According to the latter the XIVth volume of the Quadrupedes was not issued until 1802, and included in that volume were Tableaux des Mammifères... et Oiseaux.

The latter is entitled "Tableau | des | Sous-Classes, Divisions, | Sous-Divisions, Ordres | et Genres | Des Oiseaux, | par le C^{en} Lacepède; | Avec l'indication, de toutes les espèces | décrites par Buffon, et leur distribution | dans chacun des genres, | par F. M. Daudin."

On p. 334, we find the genus *Ibis* and thereunder are included:

Le Couricaca	<i>Ibis loculator</i>	XIV, 182
L'Ibis blanc	<i>candidus</i>	XV, 188
L'Ibis noir	<i>niger</i>	193
Le Courlis rouge	<i>ruber</i>	212
Le Courlis des bois	<i>cayanensis</i>	222
L'acalot	<i>mexicanus</i>	225
Le grand courlis de Cayenne	<i>albicollis</i>	228
Le matuitui des rivages	<i>griseus</i>	227
Le courlis brun a front rouge	<i>fuscus</i>	221
Le courlis blanc	<i>albus</i>	XV, 219
Le courlis verd, ou courlis d'Italie	<i>falcinellus</i>	204
Le courlis brun	<i>manillensis</i>	206
Le courlis a tête rue	<i>calvus</i>	208
Le courlis huppé	<i>cristatus</i>	210

The reference is to the volume of Birds where the bird is described under the vernaculars given.

From among these then I conclude a type of *Ibis* Lacepède must be selected. It may be that the better reference would be to *Ibis* Daudin but it matters little.

It will be at once noted that *acthiopica* Latham is missing and consequently so far Richmond's conjecture is correct and *Ibis* Lacepède (or Daudin) cannot be used any longer in the general acceptance of that name.

Though the majority of the species above belong to the family Ibiidae (auct.), only two are called in the vernacular by Buffon Ibis, *L'Ibis blanc* and *L'Ibis noir*. Moreover, under the generic heading *L'Ibis*, Buffon had written "Nous avons dit que les Anciens distinguoient deux espèces d'ibis, l'une blanche & l'autre noire."

Further, *L'Ibis blanc* is the *Tantalus ibis* of Linné; consequently, by tautonymy, this becomes the type and Richmond's suggestion is confirmed; therefore *Ibis* Lacepède, 1799 (or Daudin, 1802) must replace *Pseudotantalus* Ridgway (Proc. U. S. Nat. Mus., p. 550, 1883). *Egatheus* Billberg was absolutely introduced as a substitute for *Ibis* Lacepède and must therefore follow that name and disappear as an absolute synonym. I was not certain of this before, but Dr. Richmond has satisfied me that such was the case.

It might be noted that in the Cat. Birds Brit. Mus., Vol. XXVI, p. 4, 1896, *Ibis* was used as of Cuvier, 1816; that was an altogether different introduction, the type being *I. aethiopica* (Latham) by tautonymy. But there was a prior *Ibis* of Illiger, 1811, which was overlooked if *Ibis* Lacepède was ignored as unidentifiable, and Illiger quotes *Ibis* Lacepède in his synonymy.

Gray, in the Appendix List Genera Birds, p. 13, 1842, introduced *Threskiornis* for *Tantalus aethiopicus* Latham, and in the Cat. Gen. Subgen. Birds, p. 115, 1855, noted '*Ibis* Cuv. 1817' as a synonym of this group. This name must now be resumed. It will therefore be seen all of Richmond's suggested changes are necessary:

Ibis Lacepède, Tableau Oiseaux, 1799 (or Daudin Hist. Nat.).

Type (by tautonymy), *Ibis candidus* Daudin, 1802 (= *Tantalus ibis* Linné).

Synonyms: *Ibis* Illiger, 1811 and *Egatheus* Billberg, 1828, will replace *PSEUDOTANTALUS* Ridgway, 1883.

Threskiornis Gray, Appendix List Genera Birds, p. 13, 1842.

Type (by original designation), *Tan. aethiopicus* Latham.

Synonym: *Ibis* Cuvier, 1816 not *Ibis* Lacepède, 1799, etc., will replace *IBIS* (Cuvier) Cat. Birds Brit. Mus., Vol. XXVI, p. 4, 1896.

PLEGADIS Kaup, 1829, will remain as used in the Check-List North Amer. Birds, 3rd Ed., 1910, p. 92, but the Family name of the Ibises, *ibid.*, p. 91, will become **PLEGADIDAE**.

THIRTIETH STATED MEETING OF THE AMERICAN
ORNITHOLOGISTS' UNION.

THE Thirtieth Stated Meeting of the American Ornithologists' Union convened in Cambridge, Mass., Monday evening, November 11th, 1912. The business meeting was held in Mr. William Brewster's museum, and the public sessions, commencing Tuesday, November 12th, and lasting three days, were held in the Geological and Zoölogical Lecture-rooms of the University Museum.

BUSINESS SESSION. The meeting was called to order by the President, Mr. Frank M. Chapman. Sixteen Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 929, constituted as follows: Fellows, 46; Retired Fellows, 2; Honorary Fellows, 16; Corresponding Fellows, 59; Members, 77; Associates, 729.

During the year the Union lost sixty-six members, five by death, twenty-three by resignation, and thirty-eight for non-payment of dues. The deceased members include two Corresponding Fellows, one Member, and two Associates, as follows:

Prof. Alfred Dugès,¹ a Corresponding Fellow, who died in Mexico, January 7th, 1910, in the 84th year of his age; Dr. Wilhelm August Blasius,² a Corresponding Fellow, who died in Brunswick, Germany, May 31st, 1912, aged 67 years; Bradford Torrey,³ a Member, who died in Santa Barbara, Cal., October 7th, 1912, aged 69 years; and the following Associates: Mrs. Ellen Sheldon Farwell, who died at Lake Forest, Ill., August 6th, 1912, in her 53d year; and Capt. H. W. Small, of Staunton, Va.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were re-elected, as follows: Frank M. Chapman, President; A. K. Fisher and Henry W. Henshaw, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, F. A. Lucas, Chas. W. Richmond,

¹ For an obituary notice, see Auk, xxix, p. 434.

² For an obituary notice, see Auk, xxix, p. 571.

³ For an obituary notice see 'Notes and News' below.

Thomas S. Roberts, Witmer Stone, and Wilfred H. Osgood, members of the Council.

Edward Howe Forbush, Westboro, Mass., Louis Agassiz Fuertes, Ithaca, N. Y., and C. William Beebe, of New York City, were elected Fellows; M. A. Carriker, Jr., of Santa Marta, Colombia, was elected a Corresponding Fellow; Frederic H. Kennard, Newton Centre, Mass.; Dr. John C. Phillips, Wenham, Mass.; Norman A. Wood, Ann Arbor, Mich.; Alexander Wetmore, Lawrence, Kansas, and Miss Althea R. Sherman, National, Iowa, were elected to the class of Members, and the following one hundred and eighty-six persons were elected Associates:

Edward Raymond Adams, Washington, D. C.
Mrs. Emily C. Hall Armstrong, Hyde Park, Mass.
Mrs. Caroline Wheeler Babson, Pigeon Cove, Mass.
Chas. H. M. Barrett, Medford, Mass.
Miss Mary F. Bartlett, Boston, Mass.
Ernest Harold Baynes, Meriden, N. H.
Prof. W. B. Bell, Agricultural College, North Dakota.
Rolan H. Blood, Pepperell, Mass.
Mrs. Elizabeth Quincy Bolles, Cambridge, Mass.
Miss Louise Bond, Fort Wayne, Ind.
F. G. Bonfils, Denver, Col.
Spencer Borden, Fall River, Mass.
Henry S. Borneman, Frankford, Pa.
Mrs. Harriet T. Boyd, Dedham, Mass.
Charles T. Boynton, Highland Park, Ill.
Prof. M. A. Brannon, University, No. Dak.
William Foreacre Brantley, Pine Knoll, Ga.
Mrs. William Brewster, Cambridge, Mass.
Gorham Brooks, Boston, Mass.
H. A. Brown, Lowell, Mass.
Mrs. Henry Temple Brown, Winchester, Mass.
Charles O. Burbank, Newton Centre, Mass.
Mrs. J. W. Burckes, Waltham, Mass.
John Bird Burnham, New York City.
Jefferson Butler, Detroit, Mich.
Joseph Fletcher Calvert, London, Ontario.
Rev. Robert Francis Cheney, Southboro, Mass.
Grace E. Chipman, Sandwich, Mass.
Mrs. Annie M. L. Clark, Lancaster, Mass.
Laura F. Craft, Glen Cove, N. Y.
Mrs. Nettie S. Cressy, West Hartford, Conn.

Stanley Coulter, Lafayette, Ind.
Wallace Craig, Orono, Me.
Mrs. David Crocker, Barnstable, Mass.
Mrs. Emmons Crocker, Fitchburg, Mass.
Mrs. H. P. Cross, Providence, R. I.
Miss Ada Dana, Newton, Mass.
Mrs. Helen P. Dane, Chestnut Hill, Mass.
Mrs. Frances Stillman Davidson, Springfield, Ill.
Prof. L. Dorn, Fort Wayne, Ind.
Sarah H. Dudley, Berlin, Mass.
Charles H. Early, Hyde Park, Mass.
Scott Harrison Eaton, Lawrenceville, Ill.
Miss Phoebe Palmer Edwards, Brookline, Mass.
Vinal N. Edwards, Woods Hole, Mass.
Arthur S. Eldredge, South Lincoln, Mass.
Mrs. Mary L. Eliot, Needham, Mass.
Mrs. Mary Van Everen Ferguson, Providence, R. I.
Miss Mary B. Ferry, Norwalk, Conn.
L. H. Fingley, Providence, R. I.
Laurence B. Fletcher, Boston, Mass.
Alexander Forbes, Milton, Mass.
Dr. Augustus M. Ford, Providence, R. I.
Miss Fanny Ford, Mesilla Park, Agricultural College, New Mexico.
Mrs. John R. Freeman, Providence, R. I.
N. W. Frasure, Lancaster, Ohio.
Ira N. Gabrielson, Marshalltown, Iowa.
Severin Gertken, Collegeville, Minn.
John T. Gibson, Southborough, Mass.
Mrs. John R. Gladding, Providence, R. I.
Alfred D. Gleason, Gleasondale, Mass.
W. Vernon Godshall, Río Piedras, Porto Rico.
Lewis S. Golsan, Antangaville, Ala.
Dr. Alfred M. Gould, Malden, Mass.
Miss Isa E. Gray, Boston, Mass.
Caroline S. Greene, Cambridge, Mass.
Herbert Spencer Grimes, Branchville, Conn.
Henry Rice Guild, Boston, Mass.
Mrs. Harriette L. Hemenway, Readville, Mass.
Alexander Henderson, Chestnut Hill, Mass.
Henry Charles Higgins, Uxbridge, Mass.
William H. Hill, Brookline, Mass.
Miss Julia R. Hotchkiss, New York City.
N. F. Lenssen, Englewood, N. J.
George Lyman Hinckley, Boston, Mass.
Henry Hersey Hinckley, Boston, Mass.
Florence A. Howe, Indianapolis, Ind.

J. C. Hvoslef, Lanesboro', Minn.
H. David Ives, Southampton, N. Y.
Ida G. Jenkins, Roxbury, Mass.
Charles W. Jenks, Bedford, Mass.
Jens Knudsen Jensen, Westwood, Mass.
Chas. Eugene Johnson, Minneapolis, Minn.
Prof. Morris Johnson, Valley City, No. Dak.
Lombard C. Jones, M. D., Falmouth, Mass.
F. W. Jones, Somerville, Mass.
Frank Louis Kemerling, Denver, Colo.
William Filmore Kendrick, Denver, Colo.
Allan Keniston, Edgartown, Mass.
Bernard W. King, New York City.
Charles R. Lamb, Cambridge, Mass.
J. Howard Leman, Boston, Mass.
Harrison F. Lewis, Yarmouth, Nova Scotia.
Mrs. Herman E. Lewis, Haverhill, Mass.
Prof. O. G. Libby, Fargo, North Dakota.
Stokley Ligon, Pecos, Reeves Co., Texas.
Dr. D. Moore Lindsay, Salt Lake City, Utah.
John William Linzee, Boston, Mass.
R. B. McLain, Wheeling, W. Va.
Mrs. Mary B. Luce, Boston, Mass.
Elias P. Mann, Williamstown, Mass.
Harold Lester Madison, Providence, R. I.
George Castor Martin, Frankford, Pa.
Ella M. Ormsby Marshall, New Salem, Mass.
Edwin Stuart Mattern, Allentown, Pa.
Walter I. Mattern, Allentown, Pa.
Miss Adelina May, Lynn, Mass.
Charles Johnson Maynard, West Newton, Mass.
Charles Johnson Means, Boston, Mass.
W. C. Mells, Columbus, Ohio.
John T. Mellus, Wellesley, Mass.
Albert Rowe Merrill, Hamilton, Mass.
Robert W. Metcalf, Springfield, Mass.
Leo E. Miller, New York City.
Harry Gilman Morse, Huron, Ohio.
Frank M. Phelps, Elyria, Ohio.
Miss Lillian P. Richards, Boston, Mass.
Alexander L. Moir, Lowell, Mass.
Miss Mary Mossman, Boston, Mass.
Mrs. H. S. Newell, Duluth, Minn.
Henry H. Simpson, Fanlew, Florida.
Donald J. Nicholson, Orlando, Florida.
Arthur A. Osborne, Peabody, Mass.

Samuel Copeland Palmer, Swarthmore, Pa.
John E. Parsons, Lenox, Mass.
Mrs. Cora E. Pease, Malden, Mass.
Thomas E. Penard, Arlington, Mass.
Miss Annie S. Penfield, Boston, Mass.
Dr. George Henry Perkins, Burlington, Vt.
Rev. Edward C. Porter, Boston, Mass.
Julian K. Potter, Camden, N. J.
Charles Lincoln Phillips, Taunton, Mass.
Alfred E. Preble, North Abington, Mass.
Roy Lee Primm, Madison, Wisc.
Mrs. Henry H. Proctor, Boston, Mass.
Thomas Emerson Proctor, Topsfield, Mass.
Prof. Frederic Ward Putnam, Cambridge, Mass.
Charles R. Ramsden, Guantanamo, Cuba.
Charles Irving Rawson, Oxford, Mass.
Paul M. Rea, Charleston, S. C.
Samuel E. Beecher, Chester, Ill.
Mrs. Ellen T. C. Rockwood, Worcester, Mass.
Theodore Eric William Reynolds, Kent, Washington.
Wyman Richardson, Boston, Mass.
A. Lillian Rideout, Swampscott, Mass.
A. A. Ringwalt, Fort Wayne, Ind.
Clark L. Ring, Saginaw, Mich.
Mrs. James W. Ripley, Malden, Mass.
Charles Ripley, Dorchester, Mass.
James O. Roberts, Utica, N. Y.
Lucretius H. Ross, M. D., Bennington, Vt.
Frederic Schenck, Cambridge, Mass.
Prof. C. C. Schmidt, University, No. Dak.
Jotham B. Sewell, Brookline, Mass.
Charles Frederick Shaw, North Abington, Mass.
H. A. Shaw, Fargo, No. Dak.
Mary E. Shaw, Andover, Mass.
Henry W. Shoemaker, Riverside, Conn.
Henry H. Simpson, Fanlew, Florida.
J. Holbrook Shaw, M. D., Plymouth, Mass.
Mrs. Daniel D. Slade, Chestnut Hill, Mass.
Gilbert M. Stark, Saginaw, West Side, Mich.
Frank Everden Stevens, Somerville, Mass.
Herbert Lee Stoddard, Milwaukee, Wisc.
Allan James Stover, Corvallis, Oregon.
Francis A. Strater, Brookline, Mass.
John N. Summers, Melrose Highlands, Mass.
M. W. Tanner, Saginaw, West Side, Mich.
Henry Thurston, Floral Park, N. Y.

Franklin Tomlinson, Shelton, Conn.
Mrs. Helen M. Tower, Cambridge, Mass.
Harry Trippet, Montclair, N. J.
John G. Tyler, Fresno, Calif.
Windsor M. Tyler, M. D., Lexington, Mass.
Prof. J. William Votey, Burlington, Vt.
Henderson Wallace, Washington, Iowa.
Annie L. Warner, Salem, Mass.
Mrs. Elizabeth W. Waite, Cambridge, Mass.
Mrs. Mary Clark Waite, Medford, Mass.
Mrs. W. G. Webber, Bedford, Mass.
Harvey Wheeler, Concord, Mass.
Myron L. Whitcomb, Haverhill, Mass.
Dr. David Day Whitney, Middletown, Conn.
H. V. Williams, Agricultural College, No. Dak.
George Willett, Los Angeles, Calif.
Arthur Melvin Winslow, Worcester, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Dr. A. K. Fisher, E. W. Nelson and Dr. Chas. W. Richmond were re-appointed 'Committee on Bird Protection.'

It was voted to publish an additional Index to 'The Auk' covering the years 1901 to 1910, inclusive.

The following amendments to the By-Laws, proposed at the last Stated Meeting of the Union, were adopted. Article IV, Section 5, now reads:

"Elections to the classes of Fellows and Members shall be held in the following manner: The number to be elected shall be first decided by a majority vote of the Fellows present at the Stated Meeting at which the election is to be held, but not more than five Fellows nor more than five Members shall be elected in any one year.

At each ballot each Fellow present may vote for nominees not exceeding the full number of vacancies to be filled, and the person receiving the highest number of votes shall be declared elected, provided that he receive the votes of at least three-fourths of the Fellows present, and so on until the vacancies are filled. Any candidate who, in each of ten successive ballots, fails to receive the votes of half of the Fellows present, shall cease to be a candidate during the remainder of the Stated Meeting.

The election of either Fellows or Members may be suspended at any time by a majority vote of the Fellows present.

During election a discussion of the merits of nominees will be in order."

Article V, Section 1, now reads:

"The annual dues shall be for Fellows five dollars, for Members four, and for Associates three dollars. No dues shall be required of Retired, Honorary or Corresponding Fellows."

Section 6 of Article IV was eliminated.

PUBLIC SESSIONS. *First Day.* The meeting was called to order by the President, Mr. Chapman.

The papers read during the morning session were as follows:

'Some Labrador Notes' by Dr. Charles W. Townsend.

'The Red-winged Blackbird: A Study in the Ecology of a Cat-tail Marsh,' by Arthur A. Allen. Illustrated by lantern slides. Remarks followed by Mr. Nichols, Prof. Barrows, Mrs. Chapman, and the author.

'On the Present Status of the Bobolink, or Rice-bird, in the South,' by Edward Howe Forbush. Remarks followed by Dr. Bishop, Mr. Francis, Prof. Pearson, and the Chair.

'Queer Nesting Sites of the House Wren,' by Wilbur F. Smith. Illustrated by lantern slides.

'A new Subspecies of Crossbill from Newfoundland,' by A. C. Bent. Illustrated with specimens.

'Notes from Northern Labrador,' by A. C. Bent. Remarks followed by Messrs. Murdoch, Arnold, Pearson, and the author.

'The Nest Life of the Sparrow Hawk,' by Miss Althea R. Sherman. Remarks followed by Mr. Bowdish.

The first paper of the afternoon was:

'Informal Notes on the Work of the Field Museum in South America,' by W. H. Osgood.

The remaining papers, both illustrated by lantern slides, were:

'Further Observations on Colombian Bird Life,' by Frank M. Chapman.

'Propagation and Restoration of American Wildfowl,' by Herbert K. Job.

Immediately after adjournment an informal reception was tendered the members of the Union and their friends, by Mr. and Mrs. Charles F. Batchelder at their home on Kirkland Street.

In the evening the men of the Union were invited by Mr. Brewster to a reception at his Museum.

Second Day. The meeting was called to order by President Chapman.

The papers of the morning session were:

'The A. O. U. Check-List,' by Dr. Louis B. Bishop. Remarks followed by the Chair.

'Notes on the Panama Thrush-Warbler,' by Prof. Hubert Lyman Clark.

'Report of Progress on the 'Life Histories of North American Birds,' by A. C. Bent. Remarks followed by Mr. Cleaves, and the author.

'Some Notes from Sheepshead Bay and Manhattan Beach, New York City,' by George E. Hix. Remarks followed by Messrs. Smith, Cleaves, Bowdish, Fuertes, and the author.

'Concealing Action of the Bittern,' by Prof. Walter B. Barrows. Remarks followed by Messrs. Allen, Brewster, Arnold, Francis, Cleaves, Fuertes, Bowdish, Osgood, Peters, and Dr. Wright, Profs. Tuttle and Jones, and the author.

The following papers, all illustrated by lantern slides, were presented at the afternoon session:

'What the American Bird Banding Association has accomplished the Past Year,' by Howard H. Cleaves. Remarks followed by Messrs. Grant, Bowdish, Nichols, Bent, Baynes, and the author.

'A Biological Reconnaissance of the Okefinokee Swamp: The Birds,' by Dr. Albert H. Wright and Francis Harper. Presented by Dr. Wright.

'Notes on the Migration and Habits of some Long Island Shore Birds,' by Francis Harper, and John Treadwell Nichols. Presented by Mr. Nichols.

In the evening the members of the Union, and their friends, met at dinner at Mifflin Hall, Brattle Square. After the dinner an informal reception was held.

Third Day. The meeting was called to order by President Chapman. The papers of the session were:

'The Flight of Birds,' by Alexander Forbes. Remarks followed by Messrs. Bigelow, Brewster, Nichols, Fuertes, Grant, Batchelder, Pennock, and Webster, Prof. Barrows, Drs. Townsend and Elliot, and the author.

'A Glimpse at the Home Life of *Larus marinus*,' by Howard H. Cleaves. Illustrated by lantern slides.

'The Present Status of the Heath Hen,' by Dr. George W. Field. Illustrated by lantern slides, and a living specimen. Remarks followed by Messrs. Bigelow, Forbush, the Chair, and the author.

The following papers, in the absence of their authors, were read by title:

'Notes on the present Breeding Range of White Egrets in the United States,' by Prof. T. Gilbert Pearson.

'Passenger Pigeon: Report of the Year's Work,' by Prof. C. F. Hodge.

'Problem of Domesticating the Ruby-throated Hummingbird,' by Miss Katharine E. Dolbear.

'The Value of Bird Study in a Limited Area,' by Mrs. Alice Hall Walter.

'Two Flycatchers of the Genus *Empidonax* new to the Fauna of South Carolina,' by Arthur T. Wayne.

'Eighteen Species of Birds New to the Pribilof Islands, including Four New to North America,' by Dr. Barton W. Evermann.

'A Study of the House Finch,' by Dr. W. H. Bergtold.

'The Status of the Extinct *Meleagridæ*,' by Dr. R. W. Shufeldt.

Resolutions were adopted thanking the Museum authorities of Harvard University for the use of the Lecture-rooms; to the Nuttall Ornithological Club for the very cordial welcome and most generous hospitality extended to the visiting members and friends of the Union; to Mr. and Mrs. Charles F. Batchelder, and Mr. and Mrs. William Brewster, for the kind attentions shown the members and friends of the Union, and to Col. and Mrs. John E. Thayer for the polite invitation to the members of the Union to visit their home and Museum at Lancaster, Mass.

Thursday afternoon, November 14th, Mr. William Brewster gave the ladies of the Union an opportunity to see his collection of birds at his Museum on Riedesel Avenue.

On Friday, November 15th, after adjournment of the Union, some seventy members and friends of the Union visited Lancaster, Mass. The party was most cordially received by Col. and Mrs. John E. Thayer, and several pleasant hours were spent in an inspection of their fine museum and valuable ornithological library.

The registered attendance of members at the Stated Meeting just closed was larger than ever before, and the number of new

members elected exceeded anything in the history of the Union, due in a great measure to the active interest of one Fellow. The social features at Cambridge will long be remembered.

The next meeting of the Union will be held in New York City, the date to be determined later.

JOHN H. SAGE,
Secretary.

GENERAL NOTES.

Sabine's Gull in Massachusetts.—On September 2, 1912, two Sabine's Gulls (*Xema sabini*) were taken at Chatham, Massachusetts, and sent to me in the flesh. Both were males in adult winter plumage and the skins are now in my collection. This is, I believe, the fourth record of the occurrence of this species in the state.—F. SEYMOUR HERSEY, Taunton, Mass.

Another Bridled Tern for South Carolina.—During the early part of September, 1912, a specimen of Bridled Tern (*Sterna anæthæta*) flew into the ventilator of the Ocean Steamship, City of Memphis, while en route to Savannah. The Tern was caught and brought to Savannah and presented to Mr. Troup D. Perry, and is now in his collection; it was an adult bird in fine plumage.—G. R. ROSSIGNOL, JR., Savannah, Ga.

Caspian Tern in Chester Co., Pennsylvania.—Two Caspian Terns, (*Sterna caspia*) were shot at Lenape Park, on the Brandywine, near West Chester, on September 28, 1912, and were taken to the Philadelphia Academy of Natural Sciences for identification. One had the black summer crown, and the other the gray one of winter, or immature plumage. The two birds were together and no others were with them. They were a female and young male and were doubtless blown inland by the three days easterly storm which prevailed at the time. This I believe is the first record of this bird for Chester County. I have heard of no one having seen them previous to the time they were collected.—ROBERT P. SHARPLES, West Chester, Pa.

Fulmar in Massachusetts.—On September 23, 1912, Mr. Daniel E. Harrington picked up on the beach at Monomoy Point, Chatham, a fine adult specimen of Fulmar (*Fulmarus glacialis glacialis*) and brought it to me for identification. It was perfectly fresh and in perfect condition, it has been mounted and is now in Mr. Harrington's possession.—C. EMERSON BROWN, Boston, Mass.

White Pelican at Savannah, Georgia.— I am glad to report the capture of a White Pelican (*Pelecanus erythrorhynchos*), that was shot at the wharves in the Savannah River, the date of capture was October 9, 1912, the specimen is now in the hands of a taxidermist and is the property of Mr. Cord Asendorf, Jr.— G. R. ROSSIGNOL, JR., *Savannah, Ga.*

The Black Duck Controversy Again.— During the last two years, 1911 and 1912, I have been much interested in a pair of wild Black Ducks, apparently adult birds, that nested near a shallow pond back in the woods at my place, Newton Centre, Mass. In 1911 they raised a brood of ten young flappers, and while in 1912 they again nested there, I am unable to say what became of the young, as I was forced to let the water out of the pond before the time of their hatching. The old birds from their habits were very apparently the same pair that returned each spring, and they were of the so-called green-legged kind.

While at Monomoy Island, Mass., during the last two weeks of October, 1912, with a couple of friends, we shot a number of Black Duck of the red-legged kind (there were no green legs), among which were several that were apparently young birds; and on October 25 there fell to one of our guns a female, which from its size, plumage, and general characteristics, was so evidently young that there could be no possible doubt about it. I personally skinned and sexed this specimen, which showed its immaturity in all those ways familiar to those who handle birds. It must have been one of a very late brood, for its upper mandible was a steel gray, and had not yet begun* to show those shades of light olive green of the adult bird, and the 'nail' at the end of the upper mandible was hardly darker than the rest of the bill, and nothing like the dark and glossy black of the adult bird. The lower mandible was pinkish and still quite soft and pliable, as in the case of very young ducks, and *the bird had red legs.*

Let us hope that this is the final nail in the coffin of the Black Duck controversy, and that it may hold so securely that even Dr. Dwight may not again resurrect the corpse in some post-mortem or pre-cherubic plumage.— F. H. KENNARD, *Boston, Mass.*

The Harlequin Duck in Wyoming.— On September 15, 1912, while stopping at Moran post office near the north end of Jackson Hole, Wyoming, I noticed two flat skins of the Harlequin Duck (*Histrionicus histrionicus*) hung in the dining room of Teton Lodge. The proprietor of the Lodge, Mr. B. D. Sheffield, informed me that these birds had been shot in the vicinity, on Jackson Lake, in May about four years ago, probably in 1908. Both specimens were males in full plumage.

This species is not included in Knight's 'Birds of Wyoming,' but Prof. W. W. Cooke has kindly called my attention to a record in Coues' 'Birds of the Northwest,' p. 579, of a pair of these ducks collected by Prof. F. V. Hayden, May 31, 1860, on 'Mount. Stream.' The female contained an egg nearly ready to be laid. Examination of the records of other specimens in

the same collection shows that this 'Mountain Stream' was in the Wind River Mountains near the head waters of the Gros Ventre River east of Jackson Hole. Both of the Hayden specimens are now in the U. S. National Museum.

The Harlequin Duck has long been known to breed sparingly in the Rocky Mountains in Montana and Colorado. In 1874 Coues¹ found young in August, unable to fly, on the streams which flow into Chief Mountain Lake, Montana, and two adult females collected by the expedition at this locality on August 22 are in the National Museum. In 1881 Dr. Merrill² found several pairs breeding near Fort Custer almost exactly on the Montana-Wyoming boundary, although he failed to discover their nests. The notes of the Biological Survey contain records of a flock of eight or ten seen on St. Mary Lake by Vernon Bailey and A. H. Howell in May, 1895, and of a female seen by the same observers June 19, 1895, at Java, on the line of the Great Northern Railway between Belton and Summit in Flathead County.

In Colorado Carter³ collected eggs June 3, 1877, in Middle Park and also found the bird breeding in the same general region in Summit County, on Blue River just below Breckenridge, at an altitude of 9,200 feet.⁴ In 1881 Drew⁵ recorded it as common in San Juan County, where it was said to breed. Morrison⁶ reported in 1888 that he had often seen it through the winter at Fort Lewis on the Ute reservation and believed that it bred both in San Juan and La Plata counties.

The bird is evidently a rare breeder in the Rocky Mountains south to latitude 37, but the only records seem to be those in 1860, 1874, 1877, 1881, about 1888, 1895 and 1908. It is interesting to note that the records show that it breeds in Wyoming as well as in Montana and Colorado. The first specimens collected half a century ago and so long overlooked were in reality from Wyoming and the two records from that State are both from the Jackson Hole region, one at the north end and the other in the mountains east of the valley.—T. S. PALMER, *Washington, D. C.*

The King Eider (*Somateria spectabilis*) in **Massachusetts**.—Four years ago I had, for the first time, the pleasure of seeing this boreal species alive, and of closely examining in the flesh a male in nearly full plumage. It seemed to me then, as at present, the most beautiful of the Fuliginæ of North America. I became interested in its past and present status in Massachusetts, and made some investigations, the results of which are appended.

¹ 'Birds of the Northwest,' p. 579, 1874.

² Orn. and Ool., VI, p. 44, 1881.

³ Allen, Bull. Nutt. Orn. Club, IV, p. 50, 1879.

⁴ Cooke, 'Birds of Colorado,' Bull. 56, Agri. Exp. Sta. Colo., p. 195, 1900.

⁵ Bull. Nutt. Orn. Club, VI, p. 142, 1881.

⁶ Orn. and Ool., XIII, p. 165, 1888.

The earliest writers refer to the species as rare or very rare in Massachusetts. Alexander Wilson, according to Bonaparte was not even aware that it was a member of the North American fauna. Audubon speaks of its rare occurrence in the vicinity of the 'Bay of Boston,' and further states that "I have, however been assured by old and trustworthy gunners that the King Duck, about thirty years ago, was by no means of rare occurrence there during winter." Curiously enough I also have received the same sort of information within a year from the same type of observer. It is marvelous how many statements get into literature from fishermen, etc., a type that in my experience has proved to be exceedingly unreliable as a rule. I am aware of one market gunner dwelling on the Atlantic seaboard who is exceedingly dishonest in most of his dealings with men, yet many of his statements have worked their way verbatim into American ornithology. The query naturally suggests itself: Will a man of naturally dishonest propensities in the pursuit of a livelihood, furnish ornithological data fit to be handed down to posterity?

The King Eider, as we know it, is apparently during the winter an 'off-shore' bird, and its previous reported occurrence near the coast would indicate a change in habits. Mr. A. H. Norton (Auk, Vol. XVII, No. 1, Jan., 1900, p. 18) states that *Somateria spectabilis* feeds largely on Holothurians (*Pentacta frondosa*), hence their feeding in deeper water than *dresseri* which as far as I know, prefers in our waters, the common mussel (*Mytilus edulis* Linné) and perhaps *Modiolus modiolus* (Linné). On the other hand two King Eiders shot at Long Island on three to four fathoms of water were said by Mr. William Dutcher to be gorged with *Mytilus edulis* (Auk, Vol. V, No. 2, April, 1888, p. 174). If at former times they were near the coast it is reasonable to believe that they might have fed on *Mytilus edulis*, which is now and undoubtedly has been, abundant along our shore. That they were driven off shore before Audubon's time by the persecution of man seems unreasonable, for I am assured by a friend who has killed many Eiders in the far north that they exhibit no more fear than the other Eiders which are notably fearless. Mr. A. C. Bent of Taunton tells me that the gunners at Westport, Mass., state that these birds are common in that vicinity during winter, frequenting the outer rocky islands and reefs. 'Common' seems a strong statement, but the fact that eight were killed in one day would lead one to believe that they may be 'not rare.' They apparently know the King from the American Eider as they refer to the former as 'Cousins' and the latter as 'Wamps.' The species is undoubtedly more common than present literature and accurate observations would indicate, as systematic offshore work is a difficult problem for most ornithologists. Until further investigations are made however, it must be considered a very rare visitant in Massachusetts.

The majority of the specimens taken have been shot during the fall, but this, I think, is not due to the migration routes or periods, but to the fact that they were procured largely by gunners engaged in 'cooting,' a sport that in most localities where Scoters did not 'bed,' ceased by the first

of December. The spring flight of Scoters would bring the sportsmen out too late for King Eiders as the latter go north very early, even leaving southern Greenland late in April (W. W. Cooke, Bull. 26. Biol. Survey, p. 59.)

The fact that most of the specimens noted in Massachusetts have been juvenal males and females is no doubt due to the fact that the adult males do not migrate so far south as the females and young, a phenomenon noted in other species of birds.

The following records are all that have come to my notice, and I am greatly indebted to those who have kindly furnished me with such records as have not been previously published.

Adult male in the collection of the Boston Society of Natural History taken by Dr. Samuel Cabot, Jr., and labelled 'Massachusetts.' This bird was probably taken some sixty years ago at least.

Female ditto.

Juvenal male taken Nov. 6, 1871, at Cohasset. Now in collection of Mr. William Brewster.

Juvenal male taken during Nov., 1871. Exact locality not known. Collection of Mr. William Brewster.

Female taken Dec. 1, 1875. No exact locality. Collection of Mr. William Brewster.

Male shot at Chelsea on Jan. 6, 1875. Collection of Mr. William Brewster.

Female taken during Jan., 1875 at Chelsea. Collection of Mr. William Brewster.

Female shot by Mr. W. S. Bryant at Cohasset, Nov. 1, 1885. This specimen is now in the collection of the Museum of Comparative Zoölogy at Cambridge, Mass.

Adult male taken during the autumn of 1888 at Manomet, South Plymouth. It was alone in the cove just south of Manomet Point. (H. K. Job, Auk, Vol. XIII, No. 3, July, 1896, p. 203.)

Unsexed specimen taken at Marblehead, Nov. 24, 1889. Now in the collection of the Peabody Academy of Science at Salem. (Birds of Essex County, C. W. Townsend, p. 142.)

Juvenal male shot at Salisbury by Mr. Benj. F. Damsell on Nov. 24, 1889. (MSS. of Dr. G. M. Allen.)

The species was observed at Wood's Hole, April 10, 1893, by Capt. V. N. Edwards. (Prof. W. W. Cooke in litt.)

Juvenal male taken at Muskeget Island, April 5, 1890. (Ornith. & Ool. Vol. 15, No. 7, July, 1890, p. 110.)

Juvenal male taken at Nantucket, Jan. 15, 1891. Collection of Mr. William Brewster.

The species observed at Wood's Hole on April 10 and Nov. 16, 1893, by Capt. V. N. Edwards. (Prof. W. W. Cooke in litt.)

Two females shot on Lower Mystic Pond, Arlington on Dec. 4, 1893, by Mr. Geo. B. Frazar. (Birds of the Cambridge Region, William Brewster, p. 122.)

The species noted by Capt. V. N. Edwards at Wood's Hole on April 10 and Nov. 11, 1894. (Prof. W. W. Cooke in litt.)

Adult male taken Nov. 15, 1895, at Manomet Point. (H. K. Job, Auk, Vol. 13, No. 3, July, 1896, p. 203.)

Juvenal male taken at Nippenicket Pond, Bridgewater on Oct. 21, 1899, by Mr. Joseph E. Bassett. According to Mr. Bassett's journal there was a northeast storm on the 20th shifting to a cold N. W. gale on the 21st. The specimen is now in the collection of Mr. Arthur C. Dyke of Bridgewater from whom I learned these details though the capture of the bird has been recorded. (A. C. Bent, Auk, Vol. XIX, No. 2, April, 1902, p. 196.)

Female taken at Monomoy, April 8, 1905, by Mr. C. Otto Zerrahn of Milton, and now in his collection. It was in a flock of about ten American Eiders.

Male in nearly full plumage taken by a gunner at Manomet Point, Nov. 26, 1908, and now in my collection. It was in company with two females or juvenal males of apparently the same species for they passed near enough to me to note that they seemed more stockily built and had shorter heads than the American Eider with which I am familiar.

Four juvenal males and 4 females shot on Feb. 3, 1909, near the Hen and Chicken reef off Westport. Four of these are in the collection of Mr. A. C. Bent of Taunton, and the rest in the collection of the Bristol County Academy of Sciences at Taunton. (Mr. A. C. Bent in litt.)

Two specimens taken at Martha's Vineyard on Nov. 17, 1911. There were four birds in the flock. These specimens were sent to Mr. Owen Durfee of Fall River.—W. SPRAGUE BROOKS, Milton, Mass.

Brazilian Tree-duck (*Dendrocygna viduata*) in New Jersey.—Early last October I learned of the receipt, by Thomas Rowland, taxidermist, of New York, of an unrecognized Duck, reported to have been killed in New Jersey and sent to the taxidermist for preservation. The specimen is a Brazilian Tree-duck killed on the Hackensack Meadows in New Jersey, by Hon. John W. Griggs, of Paterson, N. J.

Governor Griggs was returning down the Hackensack River from a shooting excursion, when he saw this Duck resting on a drift log at a place where the tide overflowed the meadow, about a mile and a half above the village of Hackensack. As the bird was at once seen to be unusual, Governor Griggs shot it. It was not at all shy.

The specimen showed no signs of ever having been in captivity, but in any event its occurrence at liberty in New Jersey seems worth recording.—GEORGE BIRD GRINNELL, New York City.

An Addition to the A. O. U. Check-List.—Through the kindness of Mr. Gardner Perry of Dedham, Mass., I am able to record the following interesting capture.

In March, 1912, while shooting at Cape Canaveral, Florida, Mr. Perry secured a Bahama Duck (*Pacilonetta bahamensis* (Linn.)). Unfortunately

the specimen was not sexed though its coloring and size would favor its being a female. The bird was in company with a small flock of Green-winged Teal, and the wind at the time was southeast. It seems a strange fact that this bird has not been recorded from Florida before, a region that has so long received the attentions of sportsmen and naturalists.

Mr. Perry has generously presented this specimen to the Museum of Comparative Zoölogy at Cambridge.— W. SPRAGUE BROOKS, *Milton, Mass.*

Little Blue Heron (*Florida carulea*) in Vermont.— While on Montebello Hill, Newbury, Vt., on August 16, 1912, between 5 and 6.30 P. M., I was looking down upon a swampy meadow which lies below and in which the Bittern makes its home, and saw something unusual moving about. Using my field glasses I saw that it was a white heron wading slowly in the water. It was not so large as the Great Blue Heron with which I was familiar and was pure white except the tips of the wings which were a soft gray—evidently the Little Blue Heron in immature plumage. I could not see the legs as the water came nearly up to the body.

It moved very slowly and deliberately feeding among the plants which grew in the water. I watched it for half an hour or more until it passed out of sight around a curve. It made no call of any kind.— ANNA E. COBB, *Providence, R. I.*

Swimming of Young Herons.— In his excellent article, 'Bird Genealogy,' (Auk, XXIX, 1912, pp. 285-295), Dr. Charles W. Townsend speaks of the ease and grace in swimming shown by a young Green Heron when placed in the water. It may be of interest to note that young herons of several species sometimes take to the water voluntarily. On a trip to the breeding island of Snowy Herons near Charleston, S. C., on July 4, 1912, I found most of the young of all of the five species of herons which breed there well able to fly. Many, however, could only scramble about in the branches of their nesting trees or fly short distances to keep out of my way as I passed. As I walked around to the windward side of the island, driving numbers of young herons before me, I saw a young Louisiana Heron, which had flown a few yards up the wind, resting quietly on the water. I thought it had fallen there, and was surprised to see that it was swimming with truly swanlike grace. While I watched, about a dozen others—Louisianas, Little Blues, and, I think, one or two Snowies—flew out from shore and deliberately alighted on the water. I waited for some minutes to see how they would make back to land, and soon found that, after a short rest, they could rise with ease from the surface of the water and fly back to the trees on shore.— FRANCIS M. WESTON, JR., *Charleston, S. C.*

Northern Phalarope (*Lobipes lobatus*) in Michigan.— The status of this Phalarope as a Michigan species has been somewhat in doubt. Prof. Barrows states (Mich. Bird Life, 1912, 166), "I do not know of an actual Michigan specimen preserved anywhere." I can add one unimpeachable record—there is a female in the U. S. National Museum, No. 170,517.

taken on September 14, 1899, in Lenawee County by Dr. C. M. Butler that I examined last winter. In the University of Michigan Museum there is a mounted bird, an adult female labeled 'Michigan,' No. 1172a. A search in the original catalogue reveals no further data but I am inclined to believe that this specimen came from Mr. Jas. Hobson, at one time taxidermist at the Museum in the late seventies. Mr. Hobson did considerable collecting at the St. Clair Flats, and the bird may have been secured there.

Mr. W. E. Saunders of London, Ont., has two specimens taken at Rondeau, Lake Erie, by Mr. Phillip Burk and sent to him — one secured on October 10, 1906, and a female on October 20, 1906.— B. H. SWALES, *University of Michigan Museum*.

Black Vulture in Vermont.— On July 7, 1912, a Black Vulture (*Catharista urubu*) was shot in Pawlet, Vt., a town adjoining this but just across the New York line. It was brought to me for identification and is being mounted by a local taxidermist. It seemed to be an old bird in fine plumage and the wonder is that it should be taken several hundred miles north of its summer home.— F. T. PEMBER, *Granville, N. Y.*

The Swallow-tailed Kite in DeWitt Co., Illinois.— Early in June, 1906, I observed a bird of this species circling about over the open hills along Salt Creek, about 5 miles southeast of Clinton. The bird was perfectly unconcerned by my presence, and continued its soaring flight within easy gun range, making its identification a certainty.— EDWIN D. HULL, *Chicago, Ill.*

The Alder Flycatcher in Colorado.— I beg to record two specimens of the Alder Flycatcher (*Empidonax traillii alnorum*), for Colorado. They constitute the second and third records for the state, the first being a specimen taken by C. E. Aiken, near Limon, Colorado, May 27, 1905.¹ The identification of my birds as of Aiken's is by H. C. Oberholser of the Biological Survey. The first is an adult bird taken in the Clear Creek valley, west of Denver, June 4, 1911, and the second an immature male taken in same locality August 6, 1911. The dates of collection somewhat suggest breeding birds and it is by no means unlikely, that we may be able to add this species to our list of summer residents. Both of the above specimens are now in my collection.— F. C. LINCOLN, *Colorado Museum of Natural History, Denver, Colo.*

Arkansas Kingbird in Massachusetts.— On October 20, 1912, at Monomoy Island, Chatham, Mass., and just off the heel of Cape Cod, I shot an immature male Arkansas Kingbird (*Tyrannus verticalis*). The bird was flitting about some clumps of bayberry bushes, among the sand dunes near our club house, and first attracted the attention of our club attendant by its bright yellow belly.

¹ A History of the Birds of Colo., by W. L. Selater, p. 275.

I was unable to get near enough to the bird to examine it closely, for while by its actions evidently lost and confused, it was still shy, and I shot it on the supposition that it would prove to be in all probability a stray Crested Flycatcher. This species has been but seldom seen east of the Mississippi River; being, I believe, reported in Wisconsin, New York, New Jersey, and Maryland, and once only in New England, a specimen having been shot at Elliot, Maine, in October, 1865, by Mr. George E. Brown, as reported by Henry A. Purdie in the 'Bulletin of the Nuttall Ornithological Club' Vol. 1, no. 3, p. 73.— F. H. KENNARD, *Boston, Mass.*

Yellow-headed Blackbird in Virginia.— On August 29, 1912, about 6 A. M., Capt. Wm. T. Abbott, of Chincoteague, Accomac Co., Va., saw two Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*), male and female, in some willow trees along the margin of a fresh water pond on Wallop's Island. The birds were unknown to him and he shot one, the female, which he presented to me. The place where he found these birds was near his truck patch, where there are scattered pine trees and many wax myrtle bushes about marshy spots and fresh water ponds. In this same locality the Boat-tailed Grackles were numerous, and I also saw several Red-winged Blackbirds there.

The male Yellow-headed Blackbird remained about the place for several days, as Capt. Abbott saw him on two occasions before I left on the 9th of September.

The stomach of the female was sent to the Biological Survey, Washington, D. C.— B. H. WARREN, *Everhart Museum, Scranton, Pa.*

The Slate-colored Fox Sparrow Breeding in Colorado.— Records of this bird (*Passerella iliaca schistacea*) for Colorado are not plentiful and its whole status is rather unsatisfactory; no doubt due to some extent to its retiring habits and preference for dense and practically impenetrable willow and alder thickets. It was formerly supposed that the type specimen was collected in Colorado, but this was found to be an error.¹ Mr. Ridgway¹ states that it breeds in Colorado along 'streams of the mountain parks'; and for some time this constituted the only record. Since then a number of specimens have been taken, most of them recorded as follows:—"an adult male taken July, 1889, at Florissant, by Dr. J. L. Goodale," "Mr. David Bruce of Brockport, N. Y., took one on the Grand River near Glenwood Springs during June, 1897."² This bird was seen several times and was thought to be breeding. There was also a mounted specimen in the "Carter collection taken near the mouth of the Blue River in Grand County, July 5, 1877, at nearly 7000 feet."³

These records, together with an unrecorded pair from the Carter Col-

¹ Birds of Colorado, Part I, W. W. Cooke, p. 107.

² Birds of Colorado, Part II, W. W. Cooke, p. 167.

³ Birds of Colorado, Part III, W. W. Cooke, p. 216.

lection, now in the Colorado Museum of Natural History, taken near Breckenridge, July 5 and 9, 1877; and one taken in Deer Park, Routt County, April 18, 1911, by Dr. L. J. Hersey, confirm to a great degree this bird's residency in Colorado during its breeding period.

It was, however, the pleasure of the author to remove any existing doubt by collecting an adult female with one fledgling, June 24, 1912, on the Grand River, in Grand County, at an elevation slightly over 8000 feet. The fledgling had unquestionably been raised in the immediate vicinity as it was just able to support itself for short flights. I believe this is also the highest altitude from which it has yet been taken. This will undoubtedly supply the evidence Mr. Selater required to include it in his list of Colorado breeding birds and save straining the point Prof. Cooke mentions in 'The Condor.'¹—F. C. LINCOLN, *Colorado Museum of Natural History, Denver, Colo.*

Harris's Sparrow in Eastern Ontario.—It gives me pleasure to record the capture of the first specimen of Harris's Sparrow (*Zonotrichia querula*) for eastern Ontario. The bird was taken from a mixed flock of Song Sparrows and Juncos which were feeding in a garden on the outskirts of London, Ont., about eight A. M., March 18, 1907.

My attention was attracted by a single long drawn note of the same pitch and quality as that of the White-throated Sparrow and on searching through the flock I found this large dark-colored bird which was very soon secured. It is a male in immature plumage spotted irregularly on the upper breast giving a hint of the black coloration which was to come. The specimen is now number 1797 in my collection.

This species has occurred in Ohio and a number of times in Michigan but has not previously been captured in lower Ontario although it is probable that it is a regular migrant through the northwestern corner of the province.—W. E. SAUNDERS, *London, Ont.*

Magnolia Warbler in the Coast Region of South Carolina.—On October 1, 1912, I saw and positively identified a female Magnolia Warbler (*Dendroica magnolia*) at the Navy Yard near Charleston, S. C. It was feeding in the undergrowth in pine woods, and I was able to examine it carefully at short range with my glasses. While this Warbler is an abundant migrant in the upper counties—one hundred and fifty miles and more from the coast—this is, to my knowledge, only the second record of its occurrence in this region. As the specimen was not secured, this record has perhaps no scientific value; and I am noting it simply as a matter of interest.—FRANCIS M. WESTON, JR., *Charleston, S. C.*

A Few Notes on Newfoundland Birds.—The following notes may be of interest as supplementing Mr. Arnold's paper (Auk, Jan., 1912, pp.

¹ Present Status of the Colorado Check-List of Birds. W. W. Cooke, Condor, XIV, No. 4, 153.

72-79). I arrived in Newfoundland at Port aux Basque on July 7, 1911, and proceeded at once to Steenville Crossing on St. George's Bay. Here I remained one week returning to Cape Breton Island on July 14. Though my interests were mainly botanical, I made notes and observations on all the birds that came directly under my notice of which the following seem worthy of note. I was particularly anxious to study the Veery, its habits and notes, since I described it as a variety in 'The Auk' (Vol. XVII, 270, 271, 1900), based on material collected in this portion of the island.

My friend, Dr. Geo. C. Shattuck of Boston has also lately given me some notes made on the Humber River between September 13 and October 4, 1912.

Mergus americanus. AMERICAN MERGANSER.—Two seen by Dr. Shattuck.

Histrionicus histrionicus. HARLEQUIN DUCK.—Dr. Shattuck was told that this species breeds regularly on the Bay of Islands.

Botaurus lentiginosus. AMERICAN BITTERN.—One seen by Dr. Shattuck.

Ardea herodias herodias. GREAT BLUE HERON.—One seen by Dr. Shattuck.

Philohela minor. WOODCOCK.—A young chick, I think undoubtedly of this species, was closely observed running on a swamp and tree grown wood road near Indian Head on the 12th. It took at once to the underbrush, and from the locality, position of its eye, etc., I felt little doubt of its proper identification.

Agialitis meloda. PIPING PLOVER.—A pair was seen continually on the beach at the Crossing. Though I did not find their nest, they were evidently breeding and showed much anxiety at my presence when I crossed a certain portion of the beach. I believe this species has not been reported except as a migrant from this island.

Sphyrapicus varius varius. SAPSUCKER.—One seen by Dr. Shattuck.

Hylocichla fuscescens fuscescens. WILSON'S THRUSH.—Though it is not my desire to question the ruling of the American Ornithologists' Union, yet the long sought opportunity to hear the bird inhabiting Newfoundland has at last been gratified, and I am more strongly convinced than ever that my *fuliginosa* is distinct. Its darker coloring leads one at sight to confuse it with the Olive-back, and I had to shoot the bird in one case to be positive of my identification. Its call note *pheu* has what seems to me quite a different quality, and its song, if my birds were not peculiar, instead of being an uninterrupted performance is divided into three distinct parts, and unlike any Veery song I have ever heard in New England. I listened to several birds singing near the mouth of Harry's Brook, and I believe the difference would be noted by any one familiar with the stereotyped song.—R. HEBER HOWE, JR., Thoreau Museum, Concord, Mass.

Additional Notes to the 'Birds of Gallatin County, Montana'.—

These notes form an appendix to my paper published in 'The Auk,' January, 1911, pp. 26-49. The numbers are those of my list.

37. *Gallinago delicata*. WILSON'S SNIPE.— This species appears to be fairly common and regular as a winter resident in warm swamps near Bozeman. I observed seven birds on December 26, 1911.

43. *Catoptrophorus semipalmatus inornatus*. WESTERN WILLET.— Mr. W. L. Thomas of Belgrade found two nests of this species during the summer of 1911.

120. *Hesperiphona vespertina montana*. WESTERN EVENING GROSBILL.— I observed a small flock in Bozeman on January 2, 1911. The species is evidently occasionally a winter resident, though much commoner as a migrant.

126. *Leucosticte tephrocotis littoralis*. HEPBURN'S ROSY FINCH.— I observed this subspecies in company with *L. t. tephrocotis* in Bridger Cañon, March 17, 1911. Large flocks were seen and about 10 percent of the birds were of this form.

170. *Vermivora celata lutescens*. LUTESCENT WARBLER.— I observed a male of this species in song, in an aspen grove near Bozeman, July 4, 1910. It probably breeds in the region and the breeding bird is probably *V. c. celata*, but it was neither secured nor observed closely.

199. *Cyanocephalus cyanocephalus*. PIGEON JAY.— A flock of about 40 birds was observed flying over the western part of Bozeman on Sept. 11, 1911. This adds a new species to the county list, and to my knowledge, is the most westerly record for this species in Montana.—
ARETAS A. SAUNDERS.

Two new records for Washington State.— The following birds appear to be new to the State list.

Ceryle alcyon caurina. NORTHWESTERN BELTED KINGFISHER.— A specimen taken September 17, 1896, was recently identified for me by Mr. Oberholser as this new form. It was collected by me on Puget Sound, in the vicinity of Tacoma, Wash., which I believe extends their range this much southward. As I have no other specimens, some further collecting must be done in order to prove this to be the resident form.

Zonotrichia albicollis. WHITE-THROATED SPARROW.— At Sherlock, in Thurston County, on October 13, 1912, I was so fortunate as to collect a female of this Sparrow. My bird was with a very large company of Nuttall's Sparrows (*Zonotrichia leucophrys nuttalli*), which had begun to arrive the previous evening, but a careful search failed to reveal any more *albicollis*. An interesting feature of this migration, possibly of some significance, is that the local breeding *nuttalli* had long since left for the south, and the migration in question was a considerable surprise to me. I believe my bird forms a new record for the state, if not for the Pacific coast north of Oregon.— J. HOOPER BOWLES, Tacoma, Wash.

A Correction.— In 'The Auk' Vol. XXVI, Jan., 1909, p. 9, under the heading of 'Some Birds of Baker Co., Oregon' the record of *Certhia familiaris montanus* should read *Certhia familiaris zelotes*. Since making the list three years ago more specimens have been taken and a skin recently sent to the Biological Survey was identified by Mr. H. C. Oberholser as *C. f. zelotes*.—STANLEY G. JEWETT, Portland, Oregon.

An Item for Bibliographers.— A paper dealing with American birds, which is seldom or never referred to is the following: Relation succincte d'un voyage fait aux bords de l'Oostanaula en Géorgie, États-Unis,¹ par Julien Deby.

All of the matter relating to birds is included in the following extract: "I am unable to describe in detail the pleasures of a search for Unios along the flowery banks of the Oostanaula, the pleasing Indian name of which means the great waters coming from the west.

"The exhilarating sunshine of this delightful clime; the sky of azure blue, rarely flecked with clouds; the thousands of turtles grouped upon every old log and rock that overhangs the water; the Kingfisher (*Alcedo alcyon*), with piercing cry, which constantly crosses from bank to bank, and perches upon some dead or denuded branch, where it watches for its aquatic prey; the palmipeds which jump into the air, frightened by the appearance of a boat and boatman; the buzzards (*Cathartes atratus et aura*), those vultures of the new world which soar overhead in lazy circlings, on the watch for some dead animal; all these new experiences make an ineffaceable impression upon the naturalist.

"The bushes and trees teem with life; birds of bright plumage abound everywhere; the mockingbird, the nightingale of America, enchants us with its sweet notes . . ."

This effusion which might well be mistaken for a description of Paradise, while a good advertisement for Georgia, was written, we must conclude, in retrospect, when distance lent enchantment to the view. Upon what other supposition are we to account for the author's failure to mention the mosquitos, ticks and redbugs, the deer flies, fleas and bedbugs, those satellites which oft attend travellers in Dixie, to journey's end.—W. L. MCATEE, Washington, D. C.

¹Bul. de la Soc. Malacologique de Belgique XII, 1877, pp. XXI-XXV. Separates paged 1-7. The word voyage in title replaced by the word excursion. Bruxelles, 1877.

RECENT LITERATURE.

Forbush on the Game Birds, Wild-Fowl and Shore Birds.¹ This excellent report on the Water-Fowl and Game Birds of the Atlantic coast has been written, the author tells us, with a purpose — namely to set forth in an authoritative publication the facts in connection with the alarming decrease in the numbers of these birds in recent years and the imperative need of concerted efforts for their preservation. Those who read Mr. Forbush's report, — and everyone interested in game protection should do so — will agree that his purpose has been admirably accomplished. Not only in Massachusetts but in all of our eastern maritime states this book will be available as an incontrovertible argument against those who come forward to oppose legislative restrictions to gunning privileges, and who claim that game is not decreasing or that spring shooting has nothing to do with the problem.

Mr. Forbush cites reliable authors from early colonial times to the present day in sketching the history of each species, and in the majority of cases it is a history of decrease in numbers and abandoning of former breeding grounds, if not of threatened or actual extinction over at least part of the former range.

In addition, scores of reliable correspondents have supplemented the accounts, by furnishing valuable unpublished information drawn from their personal experiences.

Besides the history, each species is fully described in all the plumages in which it appears on our coasts, and a résumé is given of the time of occurrence and present abundance in Massachusetts. The nomenclature follows that of the last edition of the A. O. U. Check-List but the various vernacular names of the species are added, while the general range, usually that of the Check-List, is given. One unfortunate error in the Check-List which is copied by Mr. Forbush, should have been corrected in the recent supplement — namely the use of the name 'Red-legged Black Duck' in the Hypothetical List in connection with *Anas rubripes tristis*. The name *tristis* was not proposed for the red-legged bird but for the 'ordinary' Black Duck. The former name *obscura* being untenable, the oldest name for any form of Black Duck is *rubripes*; if there be but one form it should

¹ A History of the | Game Birds, Wild-Fowl | and Shore Birds | of | Massachu-
setts and Adjacent States | Including those used for food which have disappeared
since the | settlement of the country, and those which are now hunted | for food
or sport, with observations on their | former abundance and recent decrease | in
numbers; also the means for | conserving those still | in existence | By Edward
Howe Forbush | State Ornithologist of Massachusetts | Illustrated with Drawings
by W. I. Beecroft and the Author | and Photographs by Herbert K. Job and
others | Issued by the | Massachusetts State Board of Agriculture | By Authority
of the Legislature, 1912. Roy. 8vo. pp. i-xiv + 1-622, plates I-XXXVI, text
figs. 1-26 [+ 82 not numbered].

be called *Anas rubripes* but if there be two then the Red-legged form is *Anas rubripes rubripes* and the dusky-legged form *A. rubripes tristis*. The systematic treatment of the species constitutes Part I.

Part II of the report comprises histories of the species which are extinct or extirpated in Massachusetts; the Great Auk, Labrador Duck, Eskimo Curlew, Passenger Pigeon, Trumpeter Swan, Whooping Crane, Sandhill Crane, and Wild Turkey.

Part III is an admirable discussion of the conservation of Game Birds in which every element receives careful consideration.

The problem is a serious one and one that must be considered promptly and exhaustively in every state in the Union, if we are to save many of our birds from the fate which has overtaken those mentioned above. Mr. Forbush suggests seventeen steps, all or most of which must be taken if we expect to increase the supply of game birds. These include the following: establishment of (1) bird reservations, (2) systems of federal control of migrating birds, and (3) systems of town wardens in addition to state wardens; prohibiting of (1) sale and export of game, (2) sale and use of ultra-destructive firearms, (3) shooting from boats; registration of native hunters and raising of fees for alien hunters, so as to be practically prohibitive; limiting of each day's bag; reducing the number of stray dogs and cats; checking forest fires; making the open seasons as nearly uniform as possible; encouraging the propagation and sale of such game as can be raised on game farms; and more important than all the establishment of a better attitude among the public at large toward the game laws. If the laws are wilfully disregarded as is frequently the case at present all hope for improved conditions might as well be abandoned. In this very field, more perhaps than in any other, Mr. Forbush's work will do an enormous good.—W. S.

Miller on the Classification of Kingfishers.¹—Work of the kind that Mr. Miller has here presented is most welcome. Whether the multitude of bird genera that have been proposed of late years is to stand or fall there can be no question but that we need light upon both internal and external characters of the species to guide us in our final judgment, and this so far as the Kingfishers are concerned is provided in the paper before us. The treatise is divided into two parts. I. The Subfamilies of Alcedinidæ and II. The Genera of Cerylinae. In the former Mr. Miller reaches the conclusion that three subfamilies should be recognized: *Cerylinae*, *Alcedininae* and *Daceloninae*, the last two being more closely related to each other than is either to the *Cerylinae*. *Ceyx*, *Ceycopsis*, *Ispidinae* and *Myioceyx* he regards as members of the *Alcedininae* rather than of the *Daceloninae* where Sharpe placed them. In the association of these four genera with the other short tailed genera *Alcedo*, *Corythornis* and *Alcyone*, and the ex-

¹ A Revision of the Classification of the Kingfishers. By W. DeW. Miller. Bulletin of the American Museum of Natural History, XXXI, pp. 239-311. New York, September 12, 1912.

clusion of *Ceryle* we think that Mr. Miller is right and that the three subfamilies recognized represent natural phylogenetic groups.

The latter half of the paper deals with the subdivision of the old genus *Ceryle* and voluminous data are presented to show the necessity for recognizing *Megaceryle* Kaup for the crested blue-gray species, and *Chloroceryle* Kaup for the neotropical bronze-green forms, as distinct from the black and white Afro-Indian birds which constitute true *Ceryle*. Here again Mr. Miller's action appears to be fully justified in so much as these groups are quite as distinct as the other genera of Kingfishers,—certainly more so than some of them, but it is unfortunate that the material was not available for a thorough investigation of the status of the genera in the other two subfamilies some of which we think rest upon very slight characters. Incidentally Mr. Miller calls attention to the necessity, on grounds of priority, of substituting *Choucalcyon* Lesson 1831 for *Sauromarptis* Cab & Heine, and *Lacedo* Reichenbach 1851 for *Carcineutes* Cab. & Heine.—W. S.

Reed's 'Birds of Eastern North America.'¹—This volume of 456 pages is, as we are told in the preface, 'but an extension of, an enlargement upon and a combining of' the 'Bird Guides for Land and Water Birds' by the same author. We do not think however that the additions in anyway compensate for what has been lost. The 'Bird Guides' held a place of their own in our ornithological literature as they were truly pocket guides whereas the present book, though just as useful as a work of reference, is no longer a pocket edition being both too large and too heavy. As a reference book too it comes directly into competition with numerous other works of similar scope, in some of which the additional information presented here is treated much more satisfactorily.

A curious feature is the use of the bird's name in the plural in almost every instance, the significance of which is not clear. 'Parula Warblers' obviously is intended to cover the two eastern races, while 'Cape May Warblers' must refer merely to several individuals of the species, but the statement that 'Sennett's White-tailed Hawks are southern species' leaves us in doubt as to just what idea the author desires to convey. There is but one form of Sennett's White-tailed Hawk and even that is not a species but a subspecies of *Buteo albicaudatus*! The attempt to explain the significance of binomials and trinomials on page ix moreover is not very happy.

While the colored pictures which appear on every page and which formed the distinctive feature of the 'Bird Guides' will still aid many students in identifying the birds they see, we trust that the handy smaller edition will not be withdrawn.—W. S.

¹ Birds of Eastern North American. By Chester A. Reed, S. B. With colored Illustrations of every Species common to the United States and Canada from the Atlantic Coast to the Rockies. Garden City, New York, Doubleday, Page & Company. 1912.

Hellmayr and Seilern on the Birds of the Cumbre de Valencia, Venezuela.¹—This important contribution to neotropical ornithology is based upon a collection of 1200 skins made by Mr. S. M. Klages in 1909 and 1910, and comprises annotations upon 172 species or subspecies, while a list of 39 species reported by other writers of this region but not obtained by Mr. Klages is added. The following forms are described as new either from the collection itself or from other material examined in connection with its study: *Tangara guttata bogotensis*, Bogota; *Xanthoura yncas andicola*, Merida, Venezuela; *Myiodynastes chrysocephalus venezuelanus*, Cumbre de Valencia; *Pseudocolaptes boissonneautii striaticeps*, Cumbre de Valencia; *Sittasomus griseus virescens*, Cumbre de Valencia, *Premnoplex brunnescens rostratus*, Cumbre de Valencia; *Dryophila caudata klagesi*, Los Palmales, Anden von Cumaná; *Chamaea brevicauda boliviana*, Yungas, Bolivia. A number of North American species were found wintering in the region covered by Mr. Klages including *Hylocichla aliciae aliciae*, *Helminthophila* [= *Vermivora*] *peregrina*, *Mniotilta varia*, *Dendroica striata*, *D. caerulea*, *Oporornis agilis*, *Setophaga ruticilla* and *Piranga rubra rubra*.—W. S.

Hellmayr on *Zonotrichia strigiceps* Gould.²—Mr. Hellmayr reviews the history of this little known finch and tabulates the specimens so far obtained. He finds that they are separable into two races, *Z. strigiceps strigiceps* ranging from Paraná to Córdoba, in Brazil and Argentina, while *Z. s. dabbeni* described as new is restricted to the mountains of north-western Argentina.—W. S.

Nelson on New Birds from Panama, Colombia and Ecuador.³—This paper comprises the new birds obtained by Mr. E. A. Goldman on Mount Pirri and vicinity in eastern Panama near the Colombian border, from January to June, 1912, under the auspices of the Smithsonian Biological Survey of the Panama Canal Zone. This mountain reaches an altitude of 5,200 feet and as no zoölogical collector seems to have visited it previously, new forms were naturally to be expected from its slopes. Besides the new birds here described, many South American species were found which are unknown farther north. The new forms named by Mr. Nelson are as follows: *Geotrygon goldmani*, *Chloronerpes chrysochlorus aurosus*, *Aulacorhampus caeruleigularis cognatus*, *Momotus conexus reconditus*, *Electron platyrhynchus suboles*, *Eriocnemis floccus*, *Phaethornis adolphi fraterculus*,

¹ Beiträge zur Ornithologie von Venezuela. Von C. E. Hellmayr und J. Graf von Seilern. I Die Vögel der Cumbre de Valencia. Archiv für Naturgeschichte. Vol. 78, pp. 34–166, September 20, 1912.

² Bemerkungen über eine wenig bekannte, neotropische Ammer (*Zonotrichia strigiceps* Gould). Verhandlungen der Ornith. Gesellschaft in Bayern. XI, pp. 187–190. July 1, 1912.

³ Descriptions of New Genera, Species and Subspecies of Birds from Panama, Colombia and Ecuador. By E. W. Nelson. Smithsonian Miscellaneous Collections, Vol. 60, No. 3, pp. 1–25, Sept. 24 [= 27], 1912.

Thamnistes anabatinus coronatus, *Dysithamnus mentalis suffusus*, *Herpilotrichus rufimarginatus exiguus*, *Grallaricula flavirostris brevis*, *Margarornis bellulus*, *Mitrephanes eminulus*, *Caryothraustes canadensis simulans*, *Tanagra fucosus*, *Chrysothlypis chrysomelas ocularis*, *Vireolanus eximius mutabilis*, *Basileuterus melanogenys ignotus*, *B. m. eximius*, *Troglodytes festinus*, *Myadestes coloratus*, *Catharus fuscater mirabilis*. There are also three new species for which Mr. Nelson establishes new genera: *Goethalsia bella* an interesting hummingbird allied to *Goldmania*, and named in honor of Col. Goethals, head of the Panama Canal Commission; *Præda audax*, a flycatcher allied to *Aphanotriccus* but resembling *Empidonax* in color; and *Hylospingus inornatus* a tanager resembling *Chlorospingus*. Incidentally Mr. Nelson also describes *Tanagra xanthogastra quitensis* from Quito, Ecuador, and *Hemithraupis ornatus* from Truando, Colombia. The Genus *Tanagra* is used by Mr. Nelson for the genus formerly called *Euphonia* while *Tangara* is used in place of *Calospiza* (= *Calliste*). This seems inevitable if we regard these names as different and take them from the first place of publication but in the absence of any word of explanation it is misleading to those not familiar with the history of the case.—W. S.

Oberholser's Revision of the Green Herons.¹—As the result of a critical study of 568 specimens of Green Herons, *Butorides virescens*, Mr. Oberholser recognizes eighteen geographic races, twelve of which are here named as new. These are *B. v. eremomus*, north central Mexico; *B. v. mesatus*, western Nicaragua; *B. v. hypernotus*, Costa Rica to Brazil; *B. v. margaritophilus*, San Miguel Island, Bay of Panama; *B. v. cubanus*, Greater and northern Lesser Antilles; *B. v. christophorensis*, St. Christopher; *B. v. dominicanus*, Dominica; *B. v. lucianus*, St. Lucia; *B. v. barbadensis*, Barbados; *B. v. grenadensis*, Grenada; *B. v. tobagensis*, Tobago; and *B. v. curacensis*, Curaçao.

Mr. Oberholser has presented extremely detailed descriptions and a large array of measurements and his paper represents a painstaking piece of work. Whether ornithologists will endorse his views remains to be seen. With practically the same material before them Messrs. Thayer and Bangs have already (Bull. Mus. Comp. Zool., 46, p. 142) expressed precisely opposite views on the status of the San Miguel Island birds and have questioned the distinctness of several of the forms named up to that time. As San Miguel Island is but twenty miles off shore, it would indeed seem remarkable that a bird of the size and habits of a heron should there become differentiated into a local race, and in considering any group of large water birds it would seem that much more latitude should be given to individual varia-

¹ A Revision of the Subspecies of the Green Heron (*Butorides virescens* [Linn.]). By Harry C. Oberholser. Proc. U. S. Nat. Museum, Vol. 42, pp. 529-577. August 29, 1912.

tion, and the greater possibility of passage from one island to another be admitted, than in the case of small resident passerine species.— W. S.

Oberholser's One Hundred and Four new Birds from the Barusan Islands and Sumatra.¹— To those who are familiar with Mr. Oberholser's painstaking monographic work and detailed descriptions the present contribution must come as a distinct shock. The presentation of 104 new forms on 21 octavo pages naturally permits of but very brief diagnoses, but so short are some of these here given, that for all practical purposes they might as well have been omitted entirely, leaving simply a type locality. For example *Meiglyptes grammithorax micropterus* is described as "Resembling *Meiglyptes grammithorax grammithorax*, but smaller.", followed by the citation of a type specimen in the U. S. National Museum, from Nias Island. We know from this that a name has been given to a form of *M. grammithorax* from Nias, but beyond that, without measurements or further diagnosis, the publication is absolutely worthless. With a specimen of this group in hand from a neighboring island one could not possibly identify it without examining Mr. Oberholser's type. In the entire 104 diagnoses, measurements are given in only twelve instances while the descriptions average two and a half lines, including a trinomial name mentioned for comparison!

In such contributions the advancement of science seems to have been completely lost sight of, and the only explanation would seem to be the desire to secure the species to an author or the types to an institution. The promise of later detailed publications does not constitute an excuse for the issue of such useless diagnoses.

If publication of species in advance of faunal papers is absolutely necessary, the journal should devote the space, and the author the time, necessary to make the diagnoses adequate. Our rules of nomenclature are binding us more and more to the original descriptions in all systematic work and it behooves us to make these adequate.

This criticism is not directed at Mr. Oberholser but at a practice that is all too common and which we are sorry to see endorsed by him and by the Smithsonian Institution.

In foot-notes several nomenclatural matters are briefly discussed. *Dendrophassa Gloger* 1842 is substituted for *Osmotreron Bonap.* on ground of priority, while *Treron nipalensis* (Hodgson) is changed to *T. curvirostra* (Gmelin) for the same reason. *Psittinus cyanurus* (Forster) is shown to be the proper name for the bird commonly called *P. incertus* (Shaw.), while *Mixornis gularis* (Raffles) becomes *M. pileata* (Blyth), and *Lalage terat* Auct. becomes *L. nigra* (Forster). So also *Cinnyris pectoralis* (Horsf.) becomes *C. ornata* Less. and *Chalcoparia phænicotis* Auct. becomes *C. singalensis* (Gm.).— W. S.

¹ Descriptions of One Hundred and Four New Species and Subspecies of Birds from the Barusan Islands and Sumatra. Smithsonian Miscellaneous Collections. Vol. 60, No. 7, pp. 1-21. October 26, 1912.

Mathews' 'Birds of Australia.'¹—Parts 3 and 4 of the second volume of Mr. Mathews' great work are before us testifying to the energy with which the publication is being carried on. In style these parts are similar to those that have preceded them and they are fully up to the high standard that characterized the first volume. The only point wherein Mr. Mathews' work seems open to criticism is in his failure to designate type specimens for the extralimital races that he is constantly describing as new, and in the brevity of some of these descriptions. The latter practice the writer has just had occasion to criticise in another connection, while in the matter of types he has recently been put to so much trouble in attempting to ascertain the type specimens of Gould's species of Australian birds, that he naturally regrets that the modern authority on Australasian ornithology should follow, in the case of these forms, the bad example set by his predecessor. Such a practice will cause some one much trouble and research in the future.

The two parts under consideration comprise 240 pages and 26 plates practically completing Volume II. They cover the remainder of the *Procellariiformes* and most of the *Lariformes*.

The following forms are described as new, most of them from localities outside Australia. In part 3: *Pelecanoides urinatrix coppingeri*, Straits of Magellan; *Puffinaria garnotii lessoni*, Coast of Chili; *P. g. magellani*, Straits of Magellan; *Diomedea exulans rothschildi*, Australian Seas; *Thalassarche melanophrys imparida*, Tasmania; *T. m. belcheri*, Kerguelen; *T. m. richmondi*, West coast of South America; *Thalassogeron chrysostoma harterti*, Kerguelen; *Phaebetria palpebrata huttoni*, New Zealand Seas; *P. fusca campbelli*, Australian Seas; *Hydrochelidon leucopareia leggei*, Ceylon; *H. l. delalandii*, South Africa; *H. l. swinhæi*, China; *Gelochelidon nilotica addenda*, China; *G. n. grönvoldi*, South America; *Thalasseus bergii bakeri*, Mekran Coast; *T. b. edwardsi*, Ceylon; *T. bengalensis arabicus*, Red Sea. In part 4: *Sterna dougallii bangsi*, Foochow, China; *S. d. arideensis*, Seychelles; *Sturnula nereis exsul*, New Caledonia; *Melanosterna anæthetis recognita*, Bahamas; *Anous stolidus gilberti*, S. W. Australia; *Megalopterus minutus americanus*, Caribbean Sea, British Honduras, *M. m. atlanticus*, Ascension Isl.; *Procelsterna cerulea nebouzi*, Ellice and Phoenix groups and Samoa; *P. c. imitatrix*, St. Ambrose group; *Gygis alba royana*, Kermadec Islands; *G. a. monte*, Seychelles; *Bruchigavia novae-hollandiae forsteri*, New Caledonia. *Leucanous* is proposed as a new genus with *Gygis micro-rhyncha* as type, and the following subgenera are noted, *Nealbatrus*, type *Thalassogeron chlororhynchos*; *Diomedella*, type *Th. cautus*; and *Gygisterna*, type *Sterna sumatrana kemp*.

Several of Mr. Mathews' proposed changes in nomenclature affect the A. O. U. Check-List. *Thalassogeron culminatus* appears as *Th. chrysostoma culminata*, *Phaebetria palpebrata* is apparently his *P. p. huttoni*, *Gelo-*

¹ The Birds of Australia. By Gregory M. Mathews. With hand-colored Plates. Roy, 4to. Witherby and Co., London.

chelidon nilotica is *G. n. aranea* (Wilson), *Sterna caspia* becomes *Hydroprogne tsegrava* *imperator* (Coues), and *S. anæthetus* becomes *Melanosterna anæthetus* *recognita* Mathews. *Phæbastria*, *Thalasseus*, *Hydroprogne*, *Onychoprion*, *Sternula* and *Melanosterna* are regarded as genera, while in *Hydrochelidon leucoptera*, *Sterna dougalli*, *S. fuscatus* and *Anous stolidus* the specific name must be repeated on account of the recognition of extralimital races.

In the substitution of *Hydroprogne* for *Thalasseus* and *Thalasseus* for *Actocheilidon*, Mr. Mathews has the writer's hearty support.—W. S.

Bickerton's 'Home-Life of the Terns.'¹—This attractive volume constitutes the fourth of the 'Bird Lover's Home-Life Series.' In it Mr. Bickerton tells us of his visits to several Tern colonies on the English coast and his experiences in studying and photographing the five British breeding species—the Arctic, Common, Sandwich, Lesser and Roseate Terns. One chapter is devoted to Terns' habits in general, and one each to the species here especially considered while some additional notes on the Common Tern are given in chapter VII. The accounts are written in an attractive style and contain much information of value to the ornithologist as well as to the bird-lover.

We learn from Mr. Bickerton's pages that the Arctic Tern is by far the most abundant breeding species in Great Britain today, one colony numbering at least ten thousand pairs; the Common Tern comes next, the Lesser Tern is not so numerous, the Sandwich decidedly rare and the Roseate extremely so.

The protection afforded these birds during the breeding season is yielding encouraging results. In the case of the Sandwich Tern in the Ravensglass 'Gullery', which is carefully guarded by Lord Muncaster, the number of eggs recorded by the warden has increased from 120 in 1900 to 403 in 1912. As a protection against the unscrupulous raids of collectors the freshly laid eggs are each day marked by the warden with an indelible purple pencil so as to make them valueless as specimens. An idea of the rarity of the Roseate Tern may be gained from the fact that the only breeding colonies that could be found were located on rocky islets, inhabited by Arctic and Common Terns, and numbered all told not over 15 or 20 pairs while the other two species numbered respectively 10,000 and 1000 pairs. Mr. Bickerton found the Roseate Terns laying but a single egg in every nest examined, due possibly to this being on the northern limit of their breeding range.

American readers of this interesting volume will find in it a reminder of what might have been, on the New Jersey coast and elsewhere on our shores,

¹ The Home-Life of the Terns or Sea Swallows Photographed and described By W. Bickerton, F. Z. S., M. B. O. U. Vice-President of The Hertfordshire Natural History Society and Field Club, with thirty-two mounted plates London Witherby & Co., 326 High Holborn W. C. MCMXII, pp. 1-88, plates 1-32.

where the once countless hosts of breeding water birds have been practically exterminated.

Mr. Bickerton's excellent photographs are reproduced in half-tones of high quality which are mounted upon dark brown paper making a very effective series of illustrations.— W. S.

Shelley's 'Birds of Africa.'¹— The publication of this important work has been resumed after an interval of six years. Soon after the appearance of the first part of Volume V the author suffered a stroke of paralysis which resulted in his death in 1910. Arrangements were then made with Mr. W. L. Sclater to continue the undertaking and under his able direction it is hoped to bring it to an early completion.

The present volume is mainly edited from manuscripts already prepared by Capt. Shelley and covers the Shrike-like birds *Dicruridae*, *Vangidae*, *Campophagidae*, *Laniidae* and *Prionopidae*.

Two hundred and nine species are included, some of which have several subspecies. Eight colored plates similar in style to those of previous parts illustrate the volume.— W. S.

Horsbrugh and Davies on The Game-Birds and Water-Fowl of South Africa.²— Part 3 of this excellent work is now before us comprising the remainder of the Gallinaceous birds, mainly Guinea-Fowls; the Sandgrouse, Pigeons and some of the Anatidae. The plates, sixteen in number, are fully up to the standard of the previous parts.

Major Horsbrugh finds that contrary to the statements of some authors the Common Guinea-Fowl of South Africa breeds readily in captivity and crosses freely with the domestic birds.— W. S.

Thayer's Concealing Coloration, an Answer to Theodore Roosevelt.³— Mr. Thayer here defends his views against the criticism of Col. Roosevelt published in the American Museum Bulletin⁴ a year ago. He emphasizes the inconspicuousness of white at night, and reiterates several of the statements set forth in his book, which he claims his critics have entirely failed to understand. Those interested in this controversy should read Mr. Thayer's paper in full.— W. S.

¹ The Birds of Africa, comprising all the species which occur in the Ethiopian Region. By G. E. Shelley, F. Z. S., F. R. G. S., &c. Completed and Edited by W. L. Sclater, M. A., F. Z. S. Vol. V, Pt. II. London: Henry Sotheran & Co. 1912. Roy 8vo., pp. 165-502, plates L-LVII.

² The Game-Birds and Water-Fowl of South Africa. By Major Boyd Horsbrugh and Sergeant C. G. Davies. London: Witherby & Co., 326 High Holborn, W. C. Part 3. September 30, 1912.

³ Concealing Coloration, an Answer to Theodore Roosevelt. By Abbott H. Thayer. Bulletin American Museum Nat. Hist., Vol. XXXI, pp. 313-321. New York, September 14, 1912.

⁴ Vol. XXX, pp. 119-231.

Strong on Teaching a Bird Course.¹—Dr. Strong outlines his methods of conducting bird classes at the University of Chicago and his suggestions will prove valuable to teachers engaged in the same line of work. Laboratory work consists of identifications from skins which, to avoid wear and tear are wired onto handles upon which their measurements are marked. Lantern slides are also shown to test ability in identification, the students writing down the names of the birds as they appear on the screen. Field work is conducted twice a week in the spring from 7.40 to 9.10 A. M., full observations being recorded on each species observed. As Dr. Strong remarks the main object of students selecting this course is to learn to identify the birds and consequently the course is adapted to this end.—W. S.

Beal on the Food of our More Important Flycatchers.²—The food habits of these birds are discussed at length by Prof. Beal in the manner made familiar to our readers in previous publications of the Biological Survey.

Analyses of stomach contents of the 17 species of Flycatchers here considered shows that 94.99 percent. of their food consists of insects and spiders. Of this hymenoptera—bees, wasps, etc. constitute more than a third and as these insects are for the most part beneficial, this element must be weighed against the destruction of noxious species, which Prof. Beal considers more than balances it. Curiously enough the destruction of honey bees popularly charged against the Kingbird seems to have been greatly exaggerated and the greatest harm done by the birds lies in the destruction of small parasitic hymenoptera.

Admirable plates by Fuertes, all but one in colors, illustrate this valuable bulletin.—W. S.

Beal and McAtee on Food of Some Well-known Birds.³—The results of stomach examinations and field observations on twenty common birds not included in Bulletin No. 54 are here set forth, two of the species being treated by Mr. McAtee and the rest by Prof. Beal. In these publications the Department of Agriculture is spreading broadcast information on the habits and value of our birds, the influence of which has had much to do with the constantly increasing attention that is being given to bird preservation in America.—W. S.

¹ Some Ideas on Teaching a Bird Course. By R. M. Strong. Nature Study Review, Vol. 8, No. 5, pp. 1-7.

² Food of our More Important Flycatchers. By F. E. L. Beal. Bulletin 44, Biological Survey, U. S. Dept. of Agriculture, pp. 1-67, plates I-V. September 19, 1912.

³ Food of Some Well-known Birds of Forest, Farm, and Garden. By F. E. L. Beal and W. L. McAtee. Farmers' Bulletin, No. 506, U. S. Department of Agriculture, pp. 1-35, figs. 1-16. September 25, 1912.

Palmer on National Reservations for the Protection of Wild Life.—

In this circular¹ Dr. Palmer has brought together for handy reference a list of the various National reservations, where birds and wild life in general are afforded protection, together with statistics upon their extent and history of their establishment. Some information is also presented on the species of birds and game found on certain reservations, while a bibliography furnishes titles of various papers dealing with this subject. There are 95 of these reservations at present, located in 27 states and territories, and of these 56 were set aside especially as bird refuges during the past nine years. — W. S.

Economic Ornithology in Recent Entomological Publications.—

A résumé of the entire boll weevil investigation, by W. D. Hunter and W. D. Pierce, has been published as a Senate Document.² It discusses all kinds of natural enemies of the boll weevil, including birds. A schedule of stomach examinations of birds which had eaten boll weevils, on p. 146, is reprinted from Biological Survey Circular No. 64. The comment on this table is as follows:

"Exhaustive studies of the stomachs of many birds killed in infested cotton fields by the agents of the Biological Survey of this department have emphasized the fact that the birds play a considerable part in the control of the adult boll weevils. The investigation has resulted in a list of 53 species which more or less commonly feed upon the adult weevils....

"It will be noticed that the largest numbers of boll weevils were eaten during the months of July, August, and September, and also that a considerable number are consumed during the hibernating season. The most important birds are those that capture the boll weevil during the winter. According to this table these are the three species of blackbirds, two meadowlarks, six species of native sparrows, the pipit, the three species of wrens, and the two species of titmice. It will be noted that only one of the 108 quail stomachs examined showed remains of the boll weevil." On p. 145 is recorded Mr. E. A. Schwarz's observation that in Cuba "*Icterus hypomelas*) has developed a habit of extracting the immature stages from the bolls and squares."

Another weevil (*Lissorhoptrus simplex*) is said to be the most serious insect enemy of growing rice. The larvæ feed on the roots and the adults on the leaves of the rice plant. The only natural enemies recorded are birds, the records (furnished by the Biological Survey) being for the Long-billed Marsh Wren and Mallard Duck. The author of the circular³ on the rice water-weevil states that Mr. C. E. Hood of the Bureau of Entomology

¹ National Reservations for the Protection of Wild Life. By T. S. Palmer. Circular No. 87, Bureau of Biological Survey, U. S. Department of Agriculture, Svo., pp. 1-32, figs. 1-5. October 5, 1912.

² 62nd Congress, 2nd Session, No. 305, 1912, 188 pp.

³ Tucker, E. S., No. 152, U. S. Bur. Ent. July 10, 1912, 20 pp.

found remains of this species in bird droppings at Stuttgart, Ark. One of two perfect specimens of the weevil, removed from droppings was found to be alive. This observation parallels that recorded by Osborn¹ that a living specimen of another species of weevil (*Macrops lineatulus*), was found alive in bird excrement.

A third species of weevil, the plum curculio, is comprehensively monographed in Bull. 103 of the Bureau of Entomology (July 13, 1912, 250 pp.). This important pest, which causes an annual loss of several million dollars, has numerous natural enemies among which are 7 species of birds. As early as 1865, Dr. Isaac Trimble recorded that the Baltimore Oriole feeds on this insect. Investigations by the Biological Survey have confirmed this observation and have added the following names of bird enemies of the plum curculio: Orchard Oriole, Rose-breasted Grosbeak, Bank Swallow, Yellow-throated Vireo, Veery, and Hermit Thrush.

In Bulletin 106,² "The life history and bionomics of some North American ticks," notes are given on the bird enemies of 5 species of these pests. Most of the records refer to enemies of the North American cattle tick. In this connection, Pycraft is quoted relative to the depraved habit of the African Oxpecker (*Buphaga africana*) of enlarging and feeding at holes in the hides of cattle from which it has removed ticks. This publication also gives many records of the occurrence of ticks upon birds.

Five bird enemies of the spring grain aphid or green bug are mentioned by F. M. Webster and W. J. Phillips in their bulletin³ on that insect. These records were furnished by the Biological Survey and are part of the results of an investigation of the relations of birds to the green bug carried on at Winston-Salem, N. C., in 1909. A full account of this study will be published in the next Yearbook of the Department of Agriculture.

The first general economic treatment of an interesting group of insects, is Professor Herbert Osborn's "Leafhoppers affecting cereals, grasses, and forage crops (Bull. 108, Sept., 1912). More than 12 pages are devoted to a discussion of the natural enemies, 9 of them to birds. A tabulation is given of all the records (up to Jan., 1912) of leafhoppers found in bird stomachs by the Biological Survey.

The Biological Survey records show that 770 stomachs out of a total of about 47,000 examined contained leafhoppers, a proportion of about 1 in 61. Numerous species of birds are shown to eat comparatively high percentages of Jassidæ as *Setophaga ruticilla*, 13; (based on 17 stomach contents), *Polioptila caerulea*, 7.17 (39 stomachs), *Polioptila californica*, 11 (31), *Sitta pygmaea*, 43 (32), *Aimophila ruficeps*, 2.6 (25), *Passerherbulus caudatus*, 6 (44), *Calypte anna* 5.3 (111), *Dendroica aestiva*, 3.7 (116), *Lanius solitarius*, 6 (47), *Regulus calendula*, 5.7 (300), *Tachycineta thalassina*, 7.62 (80), *Telmatodytes palustris*, 4.55, (59), *Thryomanes bewicki*,

¹ Western Stock Journ. & Farmer. 10 p. 101, May, 1880.

² Hooker, W. A., Bishopp, F. C., and Wood, H. P., September, 1912.

³ 110, September, 1912.

3.03 (152), *Vireo huttoni*, 4.7 (58), and *Wilsonia pusilla*, 5.6 (67). In addition several other species of birds, whose food habits are known from examination of a large number of stomachs, eat leafhoppers to an extent of from 1.28 to 3 per cent. of their annual diet. This group includes such common species as *Chordeiles virginianus*, *Sayornis phæbe*, *Archilochus colubris*, *Empidonax difficilis*, *Geothlypis trichas*, *Iridoprocne bicolor*, *Pentstemon rufescens*, *Petrochelidon lunifrons*, and *Riparia riparia*.

These 24 species certainly feed as extensively as could reasonably be expected upon this single rather restricted group of insects. In the writer's opinion this is true also of other species among those whose Jassid feeding records are tabulated. But Professor Osborn draws a different conclusion part of which is as follows: "While at first thought we might consider birds as a most important element in control of these insects, a closer study reveals many reasons why they must depend upon them but little as a food supply. Even with this more conservative view in mind, however, the actual conditions as represented by the records of the Biological Survey are rather disappointing since they show that for practically all of our birds the leafhoppers constitute so small a portion of their food supply that birds very properly may be considered as almost negligible in any consideration of the natural agencies of control." (p. 23.)

Let us see what is said regarding some of the other natural checks. Again quoting: "Among the predaceous forms we have as the most abundant and efficient perhaps the little bugs of the family Nabidae, some of which occur in great abundance in the meadows and pastures where the leafhoppers occur. The most abundant of the species is *Reduviolus ferus* L., which occurs throughout the entire range of the United States and may be found in almost every kind of grassy land. That it is a frequent predator upon the leafhoppers is indicated by its attack upon them when they are taken in the net, although it must be said that they are very seldom found with the insects actually impaled upon their beaks in the field. It is probable that this comes from their puncturing and sucking the blood of the insect very quickly and discarding the dead bodies so promptly as not to be found with them actually impaled. I have no question that they feed upon the leafhoppers as one source of their food supply, and believe them to be one of the principal agencies in keeping the leafhoppers in check." (p. 32.)

Thus probabilities and beliefs as to efficiency give this natural enemy a high rank while nearly five pages of finely printed tabulation showing the extent to which more than 120 species of birds are known to feed upon these insects, show in this author's opinion that "birds very properly may be considered as almost negligible in any consideration of the natural agencies of control."

Another case concerns the genus *Geocoris* in the family Lygaeidae. Several reports that they attack leafhoppers and one definite record elicit the remark that they "certainly must contribute largely toward the reduction of the leafhopper pest." (p. 33.) A page of generalities upon the probable leafhopper enemies among spiders, with no definite instances what-

ever of spiders preying upon these insects preface the following remark: "When we consider the carnivorous habit and observe the immense numbers of spiders in the fields, and realize that in many cases leafhoppers are the most abundant and accessible food supply for them, it is easy to credit the spiders with immense service in this direction." (p. 35.)

In view of the nearly complete lack of evidence these strong claims for the value of spiders and heteroptera, as enemies of leafhoppers, are entirely unjustified. The tone of this section of the discussion of natural enemies, bears no relation to that of the section treating birds; the treatment is illogical and unjust.

Probably on account of long concentration upon the group of leafhoppers, the author has let this really inconsiderable portion of our insect fauna, obscure his sense of proportion. An oak leaf held close to the eyes will hide the world. As a matter of fact leafhoppers are only a small section¹ of one order of insects, and not only are some other groups of this order just as abundant in individuals, but the same is true of many groups in other orders. Birds draw their food from all these sources and there is no evidence that leafhoppers contribute less than their appropriate proportion to the total food of birds.

The author therefore has no right to be disappointed that leafhoppers constitute a small portion of the food of practically all our common birds. So also do the Coccidæ or scale insects, the Tettigidæ among Orthoptera, the Carabidæ, among beetles, etc., but this is no proof that these insects are not preyed upon in the proportion of their abundance to that of insects as a whole. It must be remembered also that animal food as a whole including crustacea, mollusca, arachnida, other invertebrates and vertebrates, forms probably not more than half of the total food of birds, this circumstance reducing by half the percentage required to give any group of animals proportional representation in the subsistence of birds. Furthermore it must be recognized that many common birds have arboreal or other specialized habits that keep them out of grass lands, the metropolis of leafhoppers.

It would be just as reasonable to say that hymenoptera may be considered as negligible in the control of leafhoppers, because only a few species are recorded as parasites of leafhoppers, and the majority of the species leave them alone, yet the author says that this order as a means of control is perhaps far more important than we readily appreciate. It probably cannot be proven that any class of predaceous or parasitic enemies of insects takes more than a small proportion of the total number of any restricted group of the prey (averaging the results for a long series of years).

In brief the arguments made by the author in the case of bird enemies

¹ For instance the number of species of leaf-hoppers forms only 1.34 per cent of the total number of species in Smith's "Insects of New Jersey" and only 1.22 per cent of the insects of the world as tabulated by Handlirsch (Die Fossilen Insekten, Part VI).

of leafhoppers, apply just as well to their other enemies. For instance he says (p. 32) of the genus *Reduviolus* of the Heteroptera, I "believe them to be one of the principal agencies in keeping the leafhoppers in check." Why does he not say the Heteroptera are of no importance as enemies of leafhoppers because only a small proportion of the species have been observed to attack them? This argument would be by no means so far fetched as that relating to birds on p. 23, namely, that as leafhoppers were found in only 170 stomachs out of 47,000 examined, birds "very properly may be considered as negligible in any consideration of the natural agencies of control."

Ostorn's further remarks that "it is useless to depend on birds for control of these insects. No amount of 'encouragement for the birds' or efforts to utilize their service in this direction can be expected to have any appreciable effect in reducing the number of leafhoppers, and we may dismiss this idea and turn our attention to other more hopeful agencies," are futile and gratuitous. This relation of enemies to prey is true not only of birds but of all natural enemies under natural conditions. It has been possible only in a very few cases to use any kind of natural enemies with striking success and as for control, it has never been accomplished except for limited areas by methods such as are now used in the distribution of the ladybird *Hippodamia convergens* by the California Board of Horticulture.

Some find it difficult to accept the inevitable truths regarding natural enemies, but happily extravagant claims for this enemy or condemnation of that, are largely disappearing from modern publications. All natural enemies should be given credit for useful tendencies, and their protection urged, but the fact must never be obscured that to obtain the degree of control necessary to commercial success, man must practically invariably depend upon direct suppressive measures of his own devising.—W. L. M.

Economic Ornithology in California.—Mr. Harold C. Bryant, who is working as a fellow in applied zoölogy on the State Fish and Game Commission foundation in the University of California, is devoting his attention to problems in economic ornithology. With Professor F. E. L. Beal's comprehensive work, embodied in Biological Survey Bulletins 30 and 34, as a general treatment of the subject and with intelligently directed local work such as Mr. Bryant is doing, to fill in the details, the economic ornithology of California will be better understood than that of any other state. Mr. Bryant has already published several papers dealing with his investigations, three of which are here reviewed.

The economic status of the Meadowlark in California, has for some years been a burning question and naturally this problem has occupied much of Mr. Bryant's time. He has recently published a preliminary paper on the subject.¹ Ranchers in the San Joaquin and Sacramento Valleys report the loss of from one-third to one-half of their grain crops

¹ Monthly Bull. State Comm. Hort. I. No. 6, May, 1912, pp. 226-231.

due to the depredations of meadowlarks on the sprouting seed. It is no wonder therefore that bills removing protection from the bird have been introduced and strenuously supported in the State legislature. Mr. Bryant's investigations justify the charges of injury to grain, but also show that as a destroyer of cutworms and grasshoppers, the meadowlark is probably unequalled by any other California bird. Thus the bird feeds upon grain pests, and clearly does a great deal to offset the direct damage it commits. Whether the bird fully pays for the grain it destroys, can only be determined when the investigation is completed.

The second paper deals with "The present and future status of the California Valley Quail."¹ While the whole paper may be considered economic ornithology in a broad sense, it does not treat the food habits in a detailed way. Mr. Bryant discusses chiefly the decrease of the bird due to hunting, and methods of preserving it in normal numbers, including recommendations on the amount of shooting that may be allowed.

The reviewer finds himself unable to agree with Mr. Bryant's statement that "Food supply is probably, in the last analysis, the most important of the factors governing numbers under natural conditions," at least with reference to species such as Quail which can if necessary live wholly upon seeds and browse. It is admitted of course that the food supply would set a definite limit did species increase up to the point of exhausting it, but normally seed-eating birds as a whole seem to come nowhere near that point. There are always tons upon tons of seeds left to decay after the requirements of all seed eaters, and of reproduction of the plants themselves are satisfied. Lack of versatility in foraging, or idiosyncrasies as to the time or place of feeding, or as to the nature of the food, may at times tend to check the increase of a species. In the East cases are recorded, and they were especially numerous about Washington last winter, in which snow-bound Quail have started to death in sheltered places, when plenty of food could be had for the searching. It is true that these deaths may have been due solely to severe and unaccustomed cold, and if this is true, it opposes the familiar argument that abundance of food is sufficient protection against freezing.

In a third paper entitled "Birds in Relation to a Grasshopper Outbreak in California,"² Mr. Bryant says: "Certain sections of California are annually troubled with grasshoppers, and there is seldom a year when they do not cause considerable damage in some part of the State. . . . Reports of damage caused by grasshoppers in 1912 first began to appear in June. The western part of Merced County, and parts of Kings and Kern Counties, were most affected. The present investigation was largely carried on in the vicinity of Los Banos, Merced County, this being one of the worst centers of infestation." (p. 3). . . . "Little damage could be noted where the grasshoppers were less than fifteen to the square yard. Where damage was

¹ Condor, XIV., July, 1912, pp. 131-142.

² Univ. Calif. Publ. Zool., Vol. 11, No. 1, Nov. 1, 1912.

greatest, alfalfa fields averaged about twenty-five to the square yard. In some pasture land along the canals, the numbers were estimated at thirty per square yard."

"Los Banos, largely on account of its great irrigation system and the large amount of land which has been swamped, supports a very large bird population. Water-birds and shore-birds are very abundant along the canals and in the marshes, whereas the pasture lands, alfalfa and the trees, furnish food and cover for many land birds. During the week's stay, July 10 to 17, 1912, twenty-two species of water- and shore-birds were recorded, and forty species of land birds." (p. 4.)

"Blackbirds, kingbirds, shrikes, and meadowlarks appeared to be feeding almost wholly upon grasshoppers, and so must be considered among the most efficient destroyers of these insects. Kingbirds and shrikes, better known as butcherbirds, were constantly seen to catch a grasshopper, carry it to the telephone wires, beat it to pieces, and eat it. The work of these birds and also of blackbirds and orioles was so evident that several ranchers reported these birds as being beneficial in the destruction of grasshoppers." (p. 7.)

"Only a few birds of each species were examined, but even these small numbers should give a fairly accurate idea of the extent to which birds in the infested areas were feeding on grasshoppers." . . . "The burrowing owl must be considered the most efficient destroyer, since parts of twenty-eight grasshoppers were found in the one stomach examined. Blackbirds and meadowlarks, however, because of the large numbers of individuals, were doing the most effective work." (pp. 7-8.)

The total number of grasshoppers daily destroyed by the entire bird population per square mile in the infested area, is estimated at 120,445, and Mr. Bryant adds: "Emphasis can well be placed on the fact that a diminution of the numbers of an injurious insect must cause a corresponding diminution of the damage done. If twenty grasshoppers are causing damage on a square yard of alfalfa the loss of even two must cause some diminution in the amount of damage done, however slight it may be. Consequently the large numbers of grasshoppers taken by birds during the outbreak must have meant a decrease in the possible damage in spite of the fact that such a decrease could not be noted." (pp. 16-17.)

Possibly this conclusion is accurate with regard to injury by grasshoppers, but it is obvious that it is not widely applicable to the reduction of damage by the destruction of insect pests by their natural enemies. For instance after even a high percentage of such pests as the plum curculio, codling moth, nut-weevils and the like, are destroyed, if the survivors thoroughly distribute their eggs, the damage to the crop will be as great as before, since one larva in a fruit as effectually ruins it for marketing as would several. It may further be remarked with reference to Mr. Bryant's statement that a decrease in damage which cannot be noted is not commercially significant.

The author's conclusions, in the main are very conservative: "Since

the time of the Mission fathers," he says, "when grasshoppers were first recorded as giving trouble, these insects have continued their ravages. The bird population during that time has undergone a considerable change. Certain water- and shore-birds, many of them known to be efficient grasshopper destroyers, and especially important because of their migratory habits, have been greatly reduced in numbers. On the other hand certain land birds, owing to a better food supply and cover, have increased in number. Perhaps the most notable example of this increase is to be found in the meadowlark, a bird which feeds almost entirely on grasshoppers when they are abundant. It seems reasonable to believe that the increase of birds has in part, at least, paralleled whatever increase of grasshoppers may have been due to the increased food supply furnished by man. But in spite of what the birds have accomplished in the destruction of these insects, they continue to give trouble. Consequently we should not be justified in saying that birds are capable of controlling all grasshopper plagues so as to prevent damage." (p. 13.)

"The average number of grasshoppers, when in normal numbers, per square yard probably does not exceed two or three, and as a rule is probably less. The bird population, though taking but a tenth as many grasshoppers at such a time, would be taking a far greater percentage of the total number of these insects than when taking the numbers found to be consumed during the outbreak. A smaller number of grasshoppers destroyed at the time of minimum numbers has a more important bearing on the prevention of an increase than a larger number destroyed at the time of maximum numbers. We can safely infer, therefore, that the regulative influence of birds is just as important throughout the year as during an insect outbreak, or even more important." (p. 16.) This conclusion agrees with that reached by Professor F. E. L. Beal, from a lifetime's work in economic ornithology. (See Yearbook U. S. Dept. Agr. 1908, pp. 343-350.)

However, Mr. Bryant's researches give proof of what has been questioned by some, namely that birds increase in numbers in areas severely infested by some insect pest, and that they vary their diet to include an abnormal proportion of the over-abundant species. "The investigation showed that the birds in the vicinity of the outbreaks changed their food habits, in that they fed on the insect most available. The fact that meadowlarks neglected their usual percentage of ground beetles and fed almost entirely on grasshoppers can be explained in two ways. Either the grasshoppers were taken in preference, or they were taken because they were the most easily obtained. The large number eaten by the killdeer, and by the Anthony green heron, horned lark, and oriole demonstrates this point, for the recorded food of these birds under other conditions does not show so large a percentage of grasshoppers."

"Undoubtedly birds flocked to the infested areas. Brewer blackbirds were seen flying out from the ranch houses to the infested areas to feed. Large flocks of bicolored red-wings fed almost entirely in the areas where grasshoppers were abundant. A census of birds taken in infested areas,

compared with one taken in a non-infested district, showed birds to be about three times as abundant in the infested areas during hours of feeding." (p. 17.)

"The failure of birds to check an insect outbreak is evident to all. Their success in preventing insects from becoming abnormally abundant is not so apparent but is no less real. All obtainable evidence, however, points to the fact that the regulative influence exerted by birds when insects are to be found in normal numbers, although less apparent, is none the less important, for at such times artificial control measures are seldom used." (p. 19.)

It is upon the comparative value of artificial control and the activities of natural enemies that the reviewer would make a few remarks. There is a deep-seated, and persistent (because founded on love of ease) idea that if natural enemies are only sufficiently encouraged and protected, crop production free from the annoyance of insect pests will be assured. That this is a dream impossible of fulfillment, is evident from the fundamental interrelations of living things. Natural enemies have developed because there was an excess of individuals of certain species that could be destroyed without any permanent decrease in the numbers of the species as a whole. In creatures with annual or shorter generations as is the case with most insects, all but an exceedingly small proportion of the offspring must die without participating in reproduction; the way of their taking off is unimportant, they may as well be eaten, as to starve, dry up or freeze. Whatever happens to the supernumeraries, a small but fecund minority remains, and the average number of the species is about the same from year to year. If there is an excess of individuals, under natural conditions, that satisfies the demands of enemies, without endangering the existence of the species, what an overwhelming excess of a species there must be where we give over acres or hundreds of acres to pure cultures of its favorite food plants. No wonder there are constantly recurring outbreaks with which natural enemies are unable to keep pace even in a relative way.

As the writer has pointed out elsewhere¹ when we consider the degree of insect control necessary to the commercial success of crops, it is evident that man must almost invariably depend upon his own efforts. We must know about natural enemies, give them all due credit, and protect them, but we must beware of exaggerating their services. People are only too easily misled in this direction but the final result of too great faith in natural enemies is disappointment. Let the student of natural economics see therefore that blame for such disappointment cannot justly be laid upon him.—W. L. M.

Some Bird Enemies of Amphipods.—In an interesting paper² covering the general life histories of 4 species of amphipods found about Ithaca,

¹ Yearbook U. S. Dept. Agr., 1911, p. 245.

² Sonderabdruck aus Internat. Rev. d. gesamten Hydrobiologie u. Hydrographie. Biol. Suppl. III, 1911 (1912), 33 pp.

N. Y., Mr. Geo. C. Embury records some original data by J. T. Lloyd and A. A. Allen, relating to the bird enemies of these crustacea. It is stated that amphipods were found in the stomachs of the Virginia rail, sora, red-winged blackbird, swamp sparrow, long-billed marsh wren, spotted sandpiper, and king eider duck. The last named bird contained 72 specimens of *Gammarus fasciatus*. The Biological Survey has identified amphipods in the stomachs of 30 species of birds, including 6 species of shorebirds, and 14 of ducks. Most of the other birds are marsh-frequenters or visitors like those mentioned by Mr. Embury. The list includes: the seaside, sharp-tailed, and song sparrows, catbird, robin, northern butcherbird, common tern, meadowlark, starling and rusty blackbird.

A recent paper¹ by Hartley H. T. Jackson, comments especially on the Shoveller Duck as an enemy of amphipods, and also lists numerous species of fish which prey upon these crustacea.—W. L. M.

Injurious African Birds.—The Fourth Report² of the Wellcome Tropical Research Laboratories contains two articles dealing with damage to grain crops by birds. The first by Harold H. King (p. 98) briefly states the importance of the matter. It is said that in one province, the losses equal one third of the grain harvested, representing a money value of £70,000.

The second article (pp. 157–177) by A. L. Butler is entitled “The finches and weaver birds of the Sudan, being notes on the group containing the birds injurious to grain crops.” The author says “the damage seems to be done entirely by the sparrows (*Passer*) and the extremely abundant weaver birds of the genera *Hyphantornis*, *Xanthophilus*, *Quelea*, and, in a smaller degree, *Pyromelana*.” (p. 157.) Reichenbach’s Weaver (*Hyphantornis tanioplerus*)” appears to be the most abundant weaver in the country, and it congregates in flocks which must, literally, often number millions. Few travellers on the White Nile can have failed to notice the immense flights of these birds, which look at a distance like great drifting clouds of smoke, and which pass overhead with a roar of innumerable wings like the rush of a hurricane. This species and *Quelea athiopica* are the most destructive birds on the White Nile.” (p. 175.)

Mr. Butler’s paper treats 23 species of finches, 53 of weaver birds, and in a postscript, one lark. The last named damages grain in the unusual way of hovering in the air and picking off single grains, but the birds come in such vast flocks that fully 50 per cent of the grain is sometimes consumed.—W. L. M.

¹ Bull. Wis. Nat. Hist. Soc., Vol. 10, Nos. 1 and 2, June, 1912, pp. 49–60.

² Khartoum, 1911.

The Ornithological Journals.

Bird Lore. Vol. XIV., No. 5. September-October, 1912.

Phoebe vs. Catbird.—A Study in Adaptability. By A. A. Allen.

The Story of Peter, a Purple Martin. By Fanny Hardy Eckstorm.

The Migration of N. A. Sparrows. By W. W. Cooke.—Towhees. Colorplates by Fuertes and Notes on Plumages by Chapman.

The California Quail and White- and Red-breasted Nuthatches furnish the subjects for the Educational Leaflets, with color plates by Allan Brooks and R. T. Brasher.

Bird Lore. Vol. XIV., No. 6. November-December, 1912.

The Magpies of Culebra Creek [Colorado]. By E. R. Warren.

Our Winter Guests. By Eliza F. Miller.—In Vermont.

A Rustic Food-House. By Frederic H. Kennard.

Gull Pensioners. By E. L. Moseley.—At Sandusky Bay, Ohio. Striking photographs by E. Niebergall.

Tame Wild Turkeys. By W. T. Davis.—In south Florida.

The Migration of N. A. Sparrows. By W. W. Cooke.—Pine Grosbeak. Color plate by Fuertes and plumage notes by Chapman.

The Chickadee by E. H. Forbush and the Willow Ptarmigan by Joseph Grinnell are the Educational Leaflets.

Annual Report of the National Association of Audubon Societies for 1912.

The Condor. Vol XIV, No. 5. September-October, 1912.

The Discovery of the Nest and Eggs of the California Pine Grosbeak. By Milton S. Ray.—A very interesting and well illustrated account of a trip into the high Sierras.

Notes from Todos Santos Islands. By A. B. Howell.—Annotations on 32 species.

Some Birds of the Saw-tooth Mountains, Idaho. By Stanley G. Jewett.—35 species.

The Wilson Bulletin. No. 80. September, 1912.

A March Bird List from the Caloosahatchee River and Lake Okeechobee. By Frank M. Phelps.—Annotated list of 93 species; illustrations from photographs by O. E. Baynard

Some Additions to a List of the Winter Birds of Southeastern Michigan. Pt. III. By B. H. Swales.—18 additional species.

Why Birds are so named. By Katie M. Roads (continued from previous number).—This paper, intended to be instructive, is on the contrary exceedingly misleading and contains numerous errors. The author of the technical name is cited as authority for the English name which he frequently is not, while many of the sentences in quotation marks are not quotations at all. Little attempt has been made to search out the full names of persons after whom birds have been named. This leaves the uninformed reader in much doubt in the case of species named '*townsendi*' where two different men have been honored.

A Study of the Avifauna of the Lake Erie Island. By Lynds Jones.—The Birds of Pelee Island, 65 species listed.

The Oölogist. Vol. XXIX, No. 9, September 15, 1912.

A Preliminary List of the Water Birds of the Middle Delaware Valley. By R. F. Miller.—An unfortunate and misleading compilation, though presented as if original. Including a number of species of which there is no record for this region.

The Oölogist. Vol. XXIX, No. 10, October 15, 1912.

Pennsylvania and New Jersey Nesting Dates for 1912. By R. C. Harlow.

Rails. By W. E. Saunders — Discusses their calls.

Summer Residents of Rutherford Co., N. C. By C. F. Moore.

The Pine Siskin. By R. B. Simpson — Nesting in Pennsylvania.

An Orange County [Fla.] Wood Ibis Rookery. By D. J. Nicholson.

The Ibis. IX Series. Vol. VI, No. 24. October, 1912.

The Birds of Gran Canaria. By David A. Bannerman.—The island is divided into six more or less distinct areas, the physical features and bird life of which are discussed, followed by an annotated list of the 84 species known from the island. There is a good map, some admirable half-tones showing the character of the country and a colored plate of *Fringilla teydea polatzeki*.

Notes on *Licmetis pastinator*. By Thomas Carter.—An excellent account of the habits of this interesting Cockatoo which has been rapidly decreasing in numbers. It is very destructive to wheat. On a strip 200 by 30 yards the entire crop was pulled down and trampled flat by the birds.

Remarks on the Stomach-contents of Birds. By C. F. M. Swynnerton.—While stomach contents showed but very few cases of birds devouring butterflies, actual observation directed especially to this question greatly increased the number. Wings and often the head as well were rejected which greatly increased the difficulty of detecting the presence of butterflies in the stomach.

The Progress and Condition of the U. S. National Museum. (From Annual Report).

Further Notes on the Birds of the Island of Formosa. By W. R. Ogilvie-Grant.—Based on the collection made by Mr. Walter Goodfellow in January, 1912. *Pyrrhula arizanica*, and *Ianthia goodfellowi* are described as new, the latter being figured in colors as well as *Dicaeum formosum* and *Parus ater ptilosus*.

On the Immature Dress of *Anser indicus* and *Dendrocycna arborea*. By F. E. Blaauw.

The Shoe-bill in the Regent's Park.—By P. L. S. With an illustration of one of those living in the Giza Zoölogical Gardens.

Bulletin of the British Ornithologists' Club, CLXXXI.—Dr. Hartert describes as new *Phyllergates cucullatus batjanensis*, Batjan, Northern Moluccas; *Stoparola panayensis obiensis*, Obi Major; *Cossypha somereni*, Kampala, Uganda.

Mr. Erwin Stresemann who had been on the second 'Freiburger Moluk-

ken Expedition,' described the following new forms; *Leucopsar* (gen. nov.) *rothschildi*, Island of Bali; *Turdus deningeri*; *Oreosterops pinaia*, and *Stigmatops monticola*, Middle Ceram; and *S. deningeri*, Buru.

A new pheasant (*Pucrasia joretiana*) was described by Rev. J. Courtois from the mountains of the province of Anhwi, China.

Mr. F. W. Smalley described the moults of the Old Squaw Duck (*Harelda hyemalis*).

Bulletin of the British Ornithologists' Club, Vol. XXX.—November, 1912. This volume of 332 pages constitutes the seventh annual 'Report on the Immigrations of Summer Residents' in England and Wales, covering the spring of 1911 and autumn of 1910. It follows the plan of the preceding reports and contains an immense amount of data. It might be remarked that while lighthouse records are definite and positive, the records of 'increase' for inland points would seem from our experience in America to be of questionable value owing to the extent to which personal opinion is involved.

The Avicultural Magazine. Vol. III, No. 11. September, 1912.

Nesting of the Black Redstart. By W. E. Teschemaker (concluded in October).

The Paradise Flycatcher. By E. C. Stuart Baker.

The Whooping Crane. By R. Cosgrave.—An excellent half-tone illustration from life.

The Avicultural Magazine. Vol. III. No. 12. October, 1912.

The Two Nonpareils. *Cyanospiza ciris* and *Erythrura prasina*. By Frank Finn.—With illustration in colors.

Cranes. By R. Cosgrave.—Illustrations of Little Brown and Wattled Cranes with Hybrid young, and young and old Demoiselles.

The Avicultural Magazine. Vol. IV, No. 1. November, 1912.

The Ring-necked Teal. *Nettion torquatum*. By D. Seth-Smith. Colored plate.

Nesting of the Winchat. By W. E. Teschemaker.

British Birds. Vol. VI. No. 4. September 2, 1912.

Spring-notes on the Border Counties. By Abel Chapman. Several original illustrations of ducks and grebe. By the author.

Observations on Manx Shearwaters and Storm-petrels at the Sally Isles. By Norman H. Joy.

British Birds. Vol. VI. No. 5. October 1, 1912.

Notes on the Bearded Tit. By Miss E. L. Turner. Illustrated.

Hybrids between Black Game and Pheasant. By Rev. F. C. R. Jourdain.

Emberiza palustris tschusii Reiser and Almasy, new to the British Isles, was taken by J. B. Nichols in Sussex.

British Birds. Vol. VI, No. 6. November 1, 1912.

Some Notes on the Breeding Habits of Nightingales. By N. F. Ticehurst. Illustrated by admirable half-tones from photographs.

The 'British Birds' Marking Scheme. Progress for 1912 and Some Results. By H. F. Witherby. 31,980 birds 'ringed' in four years.

Messrs. L. J. Rintoul and E. V. Baxter obtained the Lapland Blue Throat, new to the British Isles, on Isle of May.

Baird's Sandpiper was obtained at Rige Harbor, Sussex, Sept. 16, 1912.

The Austral Avian Record. Vol. I, No. 4. September 18, 1912.

Additions and Corrections to My Reference List to the Birds of Australia.

By Gregory M. Mathews.— 61 new subspecies.

On the Generic Name of the Barn Owl. By Gregory M. Mathews.—

Attention is called to the genus *Flammea* Fournel, Fauna de la Moselle, 1836, which is available if *Tyto* Billberg, 1828, is regarded as invalidated by the earlier *Tyto* of the same author.

The Emu. Vol. XII. Part 2. October, 1912.

Haunts of the Spotted Bower-Bird (*Chlamydodera maculata* Gld.). By Sidney Wm. Jackson.— A very interesting paper of 40 pages describing in the form of a daily diary a trip to Cambo Cambo, 500 miles northwest of Sydney, N. S. W., for the purpose of studying the habits and nidification of the Bower-Bird and other species. Admirable illustrations of the playgrounds and nests are presented as well as one of the nest of *Pseudogerygone jacksoni*, which was discovered on this trip. One of the playgrounds figured contained bleached bones of sheep, toe-bones of the Emu, pieces of glass, iron and tin nails, buttons, screws, washers, bottle-necks, small stones, pieces of Emu eggshell, pods, berries and a cartridge case. Mr. Jackson's entomological forceps and an aluminum teaspoon from his camp were soon added to the collection!

Internal Parasites Recorded from Australian Birds. By T. Harvey Johnston.

Birds of Lake Boga, Victoria. By A. Chas. Stone.— An annotated list of 162 species observed during a residence of eighteen years.

Field Ornithology in South Australia. By S. A. White. Covers the Port Augusta district.

Notes on the Mistletoe Bird (*Dicaeum hirundinaceum*). By L. G. Chandler.

Notes and correspondence indicate that Mr. Gregory Mathews' recent publications are bringing the Australian ornithologists violently face to face with the subspecies question — a problem which became familiar to Americans nearly a generation ago but which is apparently not yet settled to everyone's satisfaction.

Ornithologische Monatsberichte. September, 1912.

On the Mating Activities of the House Sparrow. J. Gengler.

Ornithological Observations on a Visit to Gratz Park. Fritz Braum.

Ornithology of North Palestine. Ernest Schmitz.

Are male birds in the Majority? O. Heinroth.

Ornithologische Monatsberichte. October, 1912.

New Species of Birds from Amazonia. E. Snethlage.— *Myrmotherula sclateri*, *Picumnus vargae*, and *Momotus momota camelensis* spp. nov.

On a new species of Dwarf Owl from Java. O. Finsch.— *Pisorhina angelinae*, sp. nov.

Two interesting breeding-birds for Lubeck. Werner Hagen.—*Ardetta minuta* and *Emberiza hortulana*.

Some Nomenclatural Remarks on Picidae. Erich Hesse.—*Dendrocopos* Koch and *Dendrocopos* Vieill. are regarded as different names, and consequently Koch's genus should not be replaced by *Dryobates* Boie. Hartert's treatment of *Picus canus biedermanni* Hesse and *Picus gorii* (Harg.) is also discussed.

Phylloscopus indicus albigula subsp. nov. Erich Hesse.

J. Thienemann records a pair of Swifts banded in 1910 which returned to the same nest box in Neustrelitz, Mecklenburg, in both 1911 and 1912.

Journal für Ornithologie. October, 1912.

A Contribution to the Ornithology of southeastern German East Africa. Hermann Grote. The first installment of an annotated list, containing 146 species. *Guttera cristata makondorum* subsp. nov.

From Suez to St. Katharine's Closter. O. Graf Zedlitz.—Second installment. *Ammomanes deserti katharinæ* subsp. nov.

On the Klein bird drawings. J. Gengler.

Remarks on some Persian birds. N. Sarudny and M. Härms.—*Passer yatii* Sharpe, *Cinnyris brevirostris* (Blauf) and *Pycnonotus leucotis* (Gould) treated in great detail.

Obituary of Wilhelm Blasius. A. Nehr Korn.

Discussion of Koenig's 'Avifauna Spitzbergenensis.'

Ornithologische Monatschrift. Vol. 37, No. 8.

Fourth Annual Report of the Reservation for Bird Protection at Subach. By Baron Hans von Berlepsch.

Verhandlungen der Ornithologischen Gesellschaft in Bayern.

XI. No. 2. July 1, 1912.

Dr. J. Gengler discusses Andreas Jäckels 'weihergegend' then and now. Baron Besserer reports on Gull-banding during 1911.

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CORRESPONDENCE.

The Concealing Coloration Question.

TO THE EDITOR OF 'THE AUK':

Dear Sir: I have read the paper on 'The Concealing Coloration Question,' by Francis H. Allen, which appeared in your October issue. While I am not prepared to offer any criticism on the merits of this paper, for or against, I do protest against articles appearing in the pages of 'The Auk' which bear such a smack of personality. Such papers only invite others of like nature, and often result in taking up too much valuable space.

Very truly yours,

RUTHVEN DEANE.

Chicago, Ill.,

December 2, 1912.

[In reply to the above and the following letters of criticism the editor desires to express his regret that any remarks objectionably personal should, through his oversight, have appeared in the pages of 'The Auk.' He found himself so strongly in sympathy with the position taken by Mr. Roosevelt and Drs. Barbour and Phillips in this discussion, that he hesitated unduly to exercise his editorial function for fear of being unfair to the other side. Consequently some statements in the paper referred to were allowed to stand, which the author should have been asked to correct and alter. 'Misquotations' and 'pieces of faulty reasoning' (p. 492) should have been clearly differentiated, for while 'misquotation' is a serious charge, 'faulty reasoning' may be faulty only in the opinion of the critic. In other words it is a matter of personal opinion. Furthermore, the two examples of alleged misquotation that are cited cannot be so regarded if the entire statements of Mr. Thayer and Mr. Roosevelt are taken into consideration. Mr. Roosevelt was in the first instance not quoting Mr. Thayer verbatim regarding the crouching hare, and merely put in quotation marks some of Mr. Thayer's expressions. What Mr. Roosevelt was pointing out was that in one statement Mr. Thayer regards the running hare as obliterated in the sight of creeping animals, which have their eyes below the level of the hare's tail, while in another statement he regards the crouching hare as boldly conspicuous in the sight of the same class of animals, and this is surely what Mr. Thayer says.

In the other case it is charged that Mr. Roosevelt has misread Mr. Thayer when he quotes him as saying that an *animal escapes observation, not because it sits motionless like a stump or clod or some such inanimate thing but purely because of its shading which he says is rendered oblitative by the countergradation of shades*.¹ Here Mr. Roosevelt used no quotation marks

¹ Italicized portion quoted verbatim from Mr. Roosevelt's paper (italics mine).

and was simply presenting Mr. Thayer's views as concisely as possible. What Mr. Thayer says is as follows: *The reader . . . is now in a position to perceive the fallacy of the statement prevalent in former years and still made by certain writers, that a protectively colored animal of the type described above escapes detection because being of a dull brown color like the ground and the bushes, it looks when it sits motionless like a clod or a stump or some such inanimate thing . . . The protectively colored animal, on the other hand, is as it were obliterated by its countergradation of shades . . . If these animals were merely brown or gray like clods or stumps they would not be concealed, because their structural forms are too distinct, and the eyes of enemies are keen to detect their characteristic modelling and outlines. On the other hand, a perfect shade gradation, even of some rankly brilliant color would go far toward concealing an animal.*¹

Mr. Roosevelt can surely not be charged with misquotation here! Mr. Allen was probably contrasting his remarks with p. 15 of Mr. Thayer's book instead of with p. 19.

There are other quotations the significance of which would be materially changed if the entire paragraph or correlative matter elsewhere were considered. Indeed in a complicated discussion such as this it is quite possible to quote apparently contradictory statements from different parts of the same paper. The editor repeats his regret that through his oversight statements like the above were allowed to pass uncorrected.

WITMER STONE.]

The Scientific Value of Bird Photographs.

TO THE EDITOR OF 'THE AUK':

Dear Sir: In selecting as the major title of his paper in 'The Auk' for October (Vol. XXIX. pp. 489-507) 'Roosevelt vs. Thayer . . . ' rather than *Revealing vs. Concealing Coloration*, Mr. Francis H. Allen evidently betrays his mental attitude toward a controversy to which his article is contributed.

Fair-minded, critical discussion of any subject tends to advance our understanding of it, but criticism which is unpleasantly personal, even discourteous in tone, which accuses a writer of misquoting, misrepresenting and perverting, of being dogmatic, ignorant, and grossly careless, obscures the main issues and for this, as well as for other reasons, is to be deplored. Particularly is this true when the criticism is not only unwarranted, but when the critic himself appears to be in error.

To illustrate Mr. Roosevelt's "inaccurate habit of mind and slap-dash style of thinking" Mr. Allen (*l. c.*, p. 492) challenges Mr. Roosevelt's reference² to photographs of certain birds as illustrating their conspicuousness in nature, and writes that Mr. Roosevelt quite overlooks "the obvious facts

¹ Italicized sentences quoted verbatim from Mr. Thayer's book (italics mine).

² Bull. Am. Mus. Nat. Hist., Vol. XXX, 1911, pp. 156; 220.

that the photographers naturally chose the conspicuous subjects, avoiding those that were at all obscured and getting their cameras into positions where the birds would come out most clearly, and thus made the birds as conspicuous as they possibly could, which was the end and aim of their work. I take it that the birds in most photographs do not appear at all as they would under average conditions in their natural surroundings."

In making this statement Mr. Allen not only does not fairly represent the views that Mr. Roosevelt expressed in the paper referred to, but he incidentally discredits the work of the bird photographer. No better answer to his criticism of Mr. Roosevelt's views can be found than in the very paper in which they are presented, and I write in this connection mainly in the defence of the field ornithologist who records some of his studies with a camera.

No doubt many bird photographs are made with the object of displaying their subject to the best advantage, but it does not follow that for this reason most bird photographs are lacking in scientific value, or that they do not faithfully portray nature. On the contrary, and replying in detail to Mr. Allen's disparaging estimate of photographs of birds in nature, I maintain, on the basis of the photographs contained in the works cited by Mr. Roosevelt, (1) that the photographer does *not* avoid subjects that "are at all obscured" (witness so-called puzzle pictures of Grouse, Woodcock, Whip-poor-will, etc.), (2) that he does *not* always make the bird as "conspicuous" as possible, (3) that to make birds conspicuous is *not* "the end and aim" of bird photography, and (4) that many bird photographs do represent birds as they appear "in their natural surroundings."

In his apparent eagerness, however, to convict Mr. Roosevelt of a "slap-dash style of thinking," and, as a side issue, the bird photographer of misrepresenting his subject, Mr. Allen fails to call attention to the fact that while Mr. Roosevelt mentions certain photographs to show that the birds portrayed are revealingly colored, so Mr. Thayer publishes the photographs of others to prove that they are concealingly colored! Thus Mr. Roosevelt refers to photographs of Black Skimmers, Gannets, Guillemots, Ibises, Cormorants, Egrets, Anhingas, Pelicans, and other birds which *are* conspicuous in nature as well as in photographs; while Mr. Thayer publishes ¹ photographs (all taken by others) of the Virginia Rail, American Bittern, Woodcock, Wilson's Snipe, Upland Plover, Ruffed Grouse, Ptarmigan, Bob-white, Whip-poor-will, Nighthawk and other protectively colored birds to show that they are protectively colored.

In passing, it is well to note that while Mr. Roosevelt freely admits that the birds just mentioned, and of which Mr. Thayer publishes photographs, *are* protectively colored, Mr. Thayer does *not* admit that *any* bird is revealingly colored. In any event, I venture to claim that both writers demonstrate the scientific value of the properly made bird photograph, whether it be used as evidence to prove conspicuousness or inconspicuousness.

¹ 'Concealing Coloration in the Animal Kingdom.'

So much for this particular case from the bird photographer's point of view; as a more general comment on Mr. Allen's condemnation of Mr. Roosevelt's "inaccurate habit of mind," it will be sufficient to quote, as above suggested, the passages which Mr. Allen instances in support of his accusation. The first occurs on page 156 of the paper referred to, where, in a foot-note, Mr. Roosevelt says:

"Mr. Job's photographs of nesting nighthawks, whip-poor-wills, grouse, quail, woodcock, snipe, and least sandpipers show birds that actually are concealed by their coloration when on their nests. His photographs of nesting gannets, murres, guillemots, black skimmers, ibises, noddies and pelicans, and his and Mr. Finley's photographs of nesting gulls, terns and herons of many species show birds of a strikingly advertising coloration which coloration reveals them to every onlooker as they sit on their nests. The young herons, although not as advertisingly colored as the adults, have a revealing rather than a concealing coloration; the young anhingas are even more advertisingly colored than the adults; the young of some of the other birds seem to be concealingly colored."

The second passage, appears on page 220 of the same paper. Here Mr. Roosevelt writes:

"Take for example the descriptions and photographs of waterbirds by Messrs. Chapman and Job; no one can look at the photos of the black skimmer and stilt on their nests without seeing that even in that critical position their coloration is highly advertising, while the coloration of their young is concealing; no one can look at the photographs of the nesting egrets, anhingas, cormorants and pelicans without seeing that both the adults and the young are exceedingly conspicuous, without a vestige of concealing coloration; no one can look at the photographs of the nesting woodcock, nighthawk, Wilson's snipe, bob-white, and upland plover without seeing that they possess a concealing coloration."

Perhaps the reader can discover in these quotations some evidence of an "inaccurate habit of mind and slap-dash style of thinking," but I confess that I have been unable to do so. To my mind Mr. Allen's whole argument is here based on his assumption that photographs of birds in nature do not represent the birds as they would appear "under average conditions in their natural surroundings," an assumption which I believe will not be supported by an unprejudiced consideration of the recorded evidence.

Very truly yours,

FRANK M. CHAPMAN.

American Museum of Natural History,
Dec. 10, 1912.

**The A. O. U. Check-List.
Third Edition.**

EDITOR OF 'THE AUK':

Dear Sir: — I beg to submit herewith some comments which I presented before the last meeting of the A. O. U. in regard to the third edition of the Check-List of North American Birds.

It was with eager interest that somewhat over a year ago I opened this volume for the first time, for, although it was my personal opinion that our knowledge of North American subspecies was not nearly complete enough for the preparation of a List that would be in any way permanent I knew that earnest, conscientious work had been done on it by able men, and I was delighted to see the result of their labors. My first impressions were altogether favorable. I liked the general arrangement, the manner in which subspecies were grouped under species and the range given for each, and the statement of the locality from which the type came. The geographical ranges seemed wonderfully complete and I found the accents a correction to many unconscious errors in pronunciation. I was pleased to find the old order retained for its convenience, and to read in the Preface the brave confession of ignorance as to a true classification; for, while such an eminent avian anatomist as Pycraft holds that the earliest birds were small and arboreal, how can we hope to prepare at present a correct phylogenetic tree, since early avian fossils are few and among them we find such specialized large and flightless birds as *Hesperornis* in the Cretaceous and *Gastornis* in the Lower Eocene? So I felt we had an altogether excellent work, which would long be the standard, and for which the Committee of the Union could not receive too much praise.

But as I began the actual use of the book in ornithological work I ran into strange anomalies and omissions that led me to suspect that though the head was undoubtedly gold baser metal might be found elsewhere. And as I read the Sixteenth Supplement, published in 'The Auk' for last July, I was still more puzzled by rulings that seemed strange, and sometimes totally inconsistent with the body of the work. For, having disclaimed responsibility for the classification and given due credit for the geographical distribution, the Committee certainly must be held responsible for the standing of all the species and subspecies recognized in this new edition. In the annual supplement, the authors can be held liable only for the changes made or rejected therein, but certainly state their belief in the correctness of the new edition as a whole by printing it over their signatures.

Musing on these matters as I turned the pages of 'The Auk,' I came to the interesting editorial which requested, it seemed to me, loyalty by the Union to the decisions of the Committee. In the value of loyalty I heartily agree, for without recognition of authority there can be no stability in nomenclature or anything else. But to whom should we be loyal! That was my first thought; for, I confess, the names of the Committee had left my memory. At the head of the article referred to I found them — the foremost American ornithologists, men who have done and are doing immensely valuable work, and to whose opinion on all questions strictly of nomenclature and classification we naturally bow. But is their judgment infallible regarding the recognition of new subspecies? Only two have done much work in this direction within recent years, and of these one is notoriously indifferent to the decisions of the Committee. As the others are certainly competent to do work of this kind, and as most of them have

an abundance of material at their disposal, I am forced to the conclusion that either they are indifferent to the subject or believe that all North American subspecies of value have already been recognized. Neither of these standpoints, I think it must be admitted, is one likely to result in a favorable attitude toward proposed subspecies, though the intention to be just to all cannot be questioned.

Loyalty to ideals or a cause is certainly noble in a nation or an individual, but it must be founded on reason and judgment else it may degenerate to mere servility, and I find many points in both Check-List and Supplement that fail to commend themselves to me. That the recognition of subspecies is of great value anyone who has read Eagle-Clarkes 'Studies in Bird Migration' will readily admit. That their recognition must be partly at least a matter of opinion, and that the Committee often have more material than the original describer is no doubt also true; still I totally fail to see why such a bird as *Creciscus coturniculus* is recognized as a full species and *Dryobates scalaris symplectus* not thought even subspecifically distinct from *Dryobates scalaris cactophilus*; why *Phalacrocorax pelagicus robustus* and *resplendens*, *Dryobates villosus leucomelas* and *auduboni*, *Dryobates pubescens medianus* and *nelsoni*, *Molothrus ater obscurus* and *Ammodramus savannarum floridanus* are considered good subspecies and the characters given for *Molothrus ater artemisiae* deemed 'too slight.' In the Anatidae we find *Olor* recognized as a genus on a difference in feathering at the bill that occurs only in the young, and *Charitonetta* on differences of even slighter value, while *Aristonetta*, *Erionetta*, *Melanitta* and *Pelionetta*, in which differences in the facial feathering or shape of bill persist through life, are called subgenera.

Nowhere can I find any reference to *Anas platyrhynchos grœnlandica* — a good subspecies and a valuable one, as in range and characters it is somewhat intermediate between the Mallard and Black Duck. From the fact that the Mallard is given only a binomial name I should infer that *A. p. grœnlandica* was not considered good, were it not for the fact that I find such European stragglers to our shores as *Corvus frugilegus*, *Corvus cornix*, *Sturnus vulgaris*, *Hirundo rustica*, *Chelidonaria urbica* and *Motacilla alba* also given only binomial names, in spite of the fact that subspecies of each are recognized by European ornithologists. That the Committee meant they did not recognize these subspecies, or that, the actual specimens on which the American records were made not being in evidence, they felt themselves unable to determine definitely the proper subspecies was my first impression, though nothing on this point can I find in the book; but by study of the 'Ranges' I discovered the Committee considered the so-called subspecies of these birds were really independent species. For the ranges of *Corvus cornix*, *Corvus frugilegus*, *Sturnus vulgaris* and *Chelidonaria urbica* as given in the Check-List practically coincide with the ranges of the subspecies *C. f. frugilegus*, *S. v. vulgaris* and *C. u. urbica* as given by Hartert, while with *Hirundo rustica* and *Motacilla alba* the ranges include that of *H. r. rustica* and *M. a. alba* with one or more additional races. In the

Check-List the range of *Penthestes cinctus* is given in the Old World as Siberia from the Yenesei River east, while this region is occupied by *P. c. oblectus* according to Hartert, *P. c. cinctus* ranging from northern Scandinavia to western Siberia. *Acanthopneuste borealis* ranges from northern Norway to Kamchatka, while by the Check-List it is confined to "Western Alaska" — a range given by Ridgway for the non-accepted *A. b. kennicotti*, although we find 'Kennicott's Willow Warbler' as the English name of the bird. On the whole for these species the Committee seem to have followed Sharpe in his Hand-List, and Sharpe was a steadfast binomialist. So we find them believing in binomials as far as European species are concerned and trinomials for American. Yet while these birds are treated with binomials we find another straggler to our shores admitted in the Sixteenth Supplement with a trinomial appellation — *Calliope calliope camtschakensis*, a form which even such an arch 'splitter' as Hartert deems unworthy of recognition.

Seeking to comprehend just where the Committee stood I turned next to American species that are only stragglers within one borders. Of the species *Spinus notatus*, *Tiaris bicolor*, *Petrochelidon fulva* and *Ceryle torquata* subspecies are generally recognized but they appear as binomials in the Check-List, while with the first three the ranges as given in the Check-List coincide with those given by Ridgway for *S. n. notatus*, *T. b. bicolor*, *P. f. fulva*, and with *C. torquata* the range includes that of the continental form or forms, *C. t. stictipennis* of the West Indies being, apparently, considered a species, which it may well be.

All this led me to study the geographical distribution more closely with the following result. I found that Connecticut had been omitted from the ranges of *Haliaeetus leucocephalus alascanus*, *Otocoris alpestris hoyti*, *Agelaius phoeniceus fortis*, *Acanthis hornemanni exilipes*, *Acanthis linaria rostrata*, *Seiurus noveboracensis notabilis* and *Hylocichla fuscescens salicicola*, and that *Aluco pratincola* was not known to breed nor *Passerherbulus maritimus maritimus* and *Dumetella carolinensis* to winter there; that the Magdalen Islands were omitted from the range of *Hydrochelidon nigra surinamensis* and *Spizella pusilla pusilla*, and Massachusetts and California from that of *Arenaria interpres interpres*; that *Macrorhamphus griseus griseus* was not known to winter in South Carolina or Texas nor *Catoptrophorus semipalmatus semipalmatus* to yet breed in Nova Scotia; that *Helodromas solitarius solitarius* was not known to occur in British Columbia nor *Aegialitis meloda* to breed in North Carolina; that *Empidonax wrighti* did not occur in Yukon Territory nor *Dendroica pensylvanica* in California that *Butorides virescens virescens* and *Buteo borealis harlani* were unknown in North Dakota and that *Vermivora celata celata* was not there in the breeding season. To find these omissions it was not necessary for me to search through literature, as specimens of practically all these birds are in my own collection and were chiefly obtained by myself during the past thirty years of field-work. Many of these records have appeared in print and those that have not were at the disposal of the Committee, if they had wished

them. If every field-ornithologist can find as many errors in the 'Ranges' I fear that part of the Check-List must be acknowledged to be very incomplete. The only one with whom I have corresponded on the subject, a man of long and intensive field experience and most careful and reliable in his work, writes that very many of the records which he published in 'The Auk' long ago were absolutely disregarded.

One more point and I am done. The European traveler to this country might feel himself quite at home with a portion of the avifauna of our eastern towns till he turned to the Check-List. Then he would find that *Sturnus vulgaris*, entering the Check-List through Greenland, had been introduced and spread rapidly through New England and the Middle States, but that *Passer domesticus* was not recognized as existing, and might think he had made a discovery or was wrong in his identification until he learned that our 'Manuals' and 'Local Lists' told quite another story. This seems to me an unfair discrimination in favor of our later assisted immigrant.

LOUIS B. BISHOP.

New Haven, Conn., November 18, 1912.

[The A. O. U. Committee as well as the membership of the Union should welcome a critical review of the Check-List by someone outside of the Committee or those who were associated with it; and that such an able and conscientious critic as Dr. Bishop can find no more serious faults than those he has set forth, after two years' study of the volume, is a matter for congratulation.

His criticisms fall under three heads:

1. The ever debatable question of which subspecies and genera shall be recognized and which shall not. This matter was so fully discussed by Mr. Joseph Grinnell and the writer in the October number of 'The Auk' that it seems scarcely worth while to revert to it. One point however, should be made clear. Never so far as known to the writer has the Committee of its own initiative opened cases for reconsideration, even when getting out a new edition of the Check-List. The province of the Committee has always been to pass judgment on changes or new forms proposed in published articles, and in authorizing a new edition of the Check-List the Union did not request or expect a revision of the forms already accepted unless their status had been questioned. If Dr. Bishop will formally state his reasons for the rejection of the subspecies to which he seems to take exception the Committee will I know reconsider the question of their recognition.

2. Dr. Bishop criticises the treatment of the English Sparrow and Starling, and of European and Asiatic stragglers which have from time to time occurred within the limits of the Check-List or which occur more or less regularly in Greenland. Here his criticism is well founded. As he correctly states, the specimens upon which the records of the exotic birds were based are, in the majority of cases, not available, and either this fact

should have been stated in the Check-List, or the treatment made uniform throughout. The ranges likewise should have been those of the *species* where the binomial is used. These discrepancies are however, not very serious in the case of these exotic species which some think have no place at all in the main text of the Check-List.

3. As regards geographical distribution Dr. Bishop seems to be just a little hypercritical. The writer undertook the preliminary revision of the ranges and was forced to limit his compilation to such works as Ridgway's 'Birds of North and Middle America,' Chapman's and Mrs. Bailey's 'Handbooks,' Bishop's list in 'The Water Fowl Family' and the latest state lists. The Index to 'The Auk' was not published at the time this work was done, and to have attempted any further research in the time at his disposal would have been impossible. Subsequently, as explained in the preface to the Check-List, Dr. Merriam and his assistants on the Biological Survey revised the ranges with the aid of the extensive records of the Survey. The fact that the writer was engaged upon this work was noticed in 'The Auk' and considerable unpublished data was submitted to him, all of which was utilized. It seems hardly fair however, to charge the Committee with failing to use unpublished material in the possession of individuals, or to search out every record of the casual occurrence of a species. Some at least of the records Dr. Bishop mentions were not published until after the Check-List appeared and the Alaskan Bald Eagle was not even shot until the Check-List was almost entirely in type!

However, it would be an admirable thing if Dr. Bishop's criticism should induce some ornithologist in each State to carefully study the ranges as given in the Check-List and supply any omissions or corrections that may be necessary, for the area with which he is familiar; in order that such material shall be available to the Committee in the future.

The more discussion and the more coöperation in this work the better.

WITMER STONE.]

Destruction of Sapsuckers.

TO THE EDITOR OF THE AUK:

Dear Sir: The Directors of the Massachusetts Audubon Society by letter, and Mr. C. J. Maynard in print,¹ have objected to the recommendation by the Biological Survey of the use of strychnine in destroying sapsuckers, because hummingbirds visit the drills to feed on the sap. I would much appreciate an allowance of space in 'The Auk' for a defense of our position.

In the first place Mr. Maynard apparently has formed his opinion from a perusal of Farmer's Bulletin 506 which contains only a brief abstract of the hundred page bulletin on 'Woodpeckers in relation to trees and wood products.' In that publication it is made clear that the greatest damage done by sapsuckers is not killing trees, but rendering defective the wood

¹ Records of Walks and Talks with Nature, VI. No. 10, Dec. 5, 1912, pp. 34-37

of valuable timber trees which they work upon year after year, but which are not seriously affected so far as health or external appearance are concerned. Mr. Maynard says: "Personally we have never seen any serious damage done to trees by sapsuckers in the eastern seaboard states from Maine to Florida." This comment means nothing; the writer has never seen hummers or other birds visit sapsucker pits, but he does not doubt the truth of observations on this point. In fact he is able to make out a much stronger case against himself than have the above mentioned persons.

Hummers probably make more of a practice of visiting sapsucker pits than any other birds, but several other species are known to do this occasionally. One species, the California Woodpecker (*Melanerpes formicivorus bairdi*) is recorded as so doing on the authority of Joseph Grinnell in Biological Survey Bulletin 39, p. 92. F. L. Gruntvig¹ states that in Wisconsin *Dryobates pubescens*, *Sitta carolinensis*, *Regulus calendula*, *Icterus galbula* and *Dendroica coronata* help themselves from sapsucker holes. N. B. Moore notes that on New Providence, Bahamas, *Cæreba bahamensis*, *Dendroica tigrina* and *D. coronata* sometimes feed at sapsucker punctures. As to the ruby-throated hummingbird Frank Bolles gives a very full account in 'From Blomidon to Smoky', pp. 131-175, and 260-273. He also mentions the downy woodpecker.

Dr. Ned Dearborn in experimenting upon sapsucker poisoning in the Angeles Forest, San Bernardino Mts., Calif., picked up 7 hummers (*Calypte anna* and *Selasphorus rufus*) and one warbler (*Vermivora rubricapilla gutturalis*) killed by strychnine in sapsucker pits in two days. It seems evident that hummers habitually visit sapsucker holes, while several other species of birds do so occasionally. The former incur much danger therefore from poisoning operations; the latter little.

Some other factors also must be considered: few people will take the trouble to poison sapsuckers; it will be done only locally, for the preservation of especially valuable ornamental or fruit-producing trees; that is, when the money or time loss is apt to be large and in such cases relief cannot be denied; poisoning in any one place need be continued for only a few days; as soon as the poisoned punctures dry danger to birds is past; the yellow-bellied sapsucker damages trees throughout the eastern United States, but except in the extreme northern part, *i. e.* in its breeding range — usually at a season when the birds known to visit its pits most frequently are absent from the country.

The problem of sapsuckers among woodpeckers is very similar to that of the few injurious members of the hawk and owl family. The whole race of raptorial birds has been popularly condemned chiefly on account of the depredations of a small proportion of the species. This question has been scientifically investigated by Dr. A. K. Fisher and his recommendations as to denial of protection to the Goshawk, Sharp-shinned and Cooper's Hawks and the Great Horned Owl have been embodied in the laws of many States.

¹ Trans. Wis. Acad. Sci., Arts and Letters X. July, 1894, pp. 113-114.

So it is with woodpeckers. The whole family has had a black name chiefly on account of the damage committed by the sapsuckers.

It has long been known that sapsuckers do some damage to trees but the subject was never properly investigated until the Biological Survey took up the work, the results of which appear in our Bulletin 39. As a consequence of this investigation it was apparent that the damage committed by these birds is very great. Manifestly it would be absurd to publish an account of such damage without making some recommendations for the relief of persons suffering loss. Even as it is, we are so far unable to recommend anything practicable to protect trees in forests, and it is here that the bulk of the damage is done, namely, the production of defects in wood which cause a lowering in the grade of lumber from the affected trees. The protective measures recommended by the Biological Survey are available for use only in orchards and ornamental plantings. This in itself tends to limit the danger to other species of birds.

The only known alternative to poisoning as an aggressive measure against sapsuckers is shooting, and of these two, we chose the lesser evil. If no recommendations as to methods of combating the birds were made, no doubt the majority of people would take the gun. We have advised against this method and in favor of poisoning because if attempts to shoot the birds were made, practically all other species of woodpeckers would suffer severely. It is well known that there is a great confusion in the popular mind regarding the identity of sapsuckers. The poisoning method itself selects the species responsible for the damage, and this is a thing which would never be done in shooting unless a competent ornithologist were hired to do the work. The Downy and Hairy Woodpeckers especially would be shot on sight. They are now very widely known as sapsuckers and they are very much more valuable birds than the hummingbirds and warblers that visit sapsucker holes. Moreover, they would be subject to shooting at any time while the other birds, with the exception of hummers, will suffer much less by reason of the use of strychnine, because their visits to sapsucker holes are only of occasional occurrence. We feel certain that we have made the recommendation involving least danger to beneficial species.

Some criticism has been elicited also by the unavoidable killing of certain birds in the campaigns against destructive rodents in the west, but we may be sure these complaints are made by people who have not suffered heavy losses from the depredations of prairie dogs, gophers, and ground squirrels. So also persons who have valuable trees ruined will not be greatly concerned if in destroying the sapsuckers they kill also a few hummingbirds. The latter in the words of Professor F. E. L. Beal,¹ really have "but little economic interest and that little is mostly in the wrong direction."

The study of the relations of woodpeckers to trees in connection with Professor Beal's study of their food habits, really for the first time made clear the economic status of these birds. The fixing of blame upon the true

¹ Farmers' Bull. 506. 1912, p. 17.

offenders, and freeing the others from the stigma of guilt is a benefit to the useful species. Moreover it advances the cause of bird protection as a whole. If the protection of birds is to rest upon an economic basis the truth must be learned and told or the whole movement receive a setback. If bird protection, on the other hand, is to be based upon æsthetic principles, the writer will agree and support the cause, if only the pleading be on that basis. But in the scientific study of economic values, utilitarianism must prevail, and the rule of the greatest good to the greatest number be uncompromisingly applied.

W. L. McATEE.

NOTES AND NEWS.

'THE AUK' is indebted to Mr. Louis Agassiz Fuertes for the admirable drawing of the Great Auk which with the present issue replaces the cover design that has done service for the past thirty years. While it may be true that our familiarity with living Great Auks has not increased in this period, it is equally true that in that time an artist has been developed, whose ability in depicting bird life, has enabled him to make what is unquestionably a far closer approximation to the actual appearance of this famous bird, than was possible for any of our bird-artists of a quarter of a century ago.

Mr. Fuertes has moreover had the benefit of suggestions from Mr. D. G. Elliot, Dr. Frederic A. Lucas, and Mr. Frank M. Chapman; while the rocky islet upon which his birds are shown, is based upon a photograph of Funk Island, where Dr. Lucas in 1887 procured a large collection of Great Auk bones.

In the first number of 'The Auk' January, 1884, Dr. Elliott Coues in commenting upon criticisms of the name of the journal, hoped that instead of becoming extinct like its namesake, 'The Auk' might long flourish, and that in it the bird might live again — or as he put it "*in pennis ALCA rediviva*." In the 28 years of Dr. Allen's guidance this hope has been amply fulfilled, so far as the text is concerned; and we can now say the same thing of our cover, or following Dr. Coues — "*in pennis Fuertesi ALCA rediviva*!"

BRADFORD TORREY, a Member of the American Ornithologists' Union and widely known as a writer of outdoor sketches, died at Santa Barbara, Cal., October 7, 1912, after a short illness. He was born at Weymouth, Mass., October 9, 1843, a son of Samuel and Sophronia (Dyer) Torrey, and was educated in the public schools of his native town. After completing his school course at the age of eighteen, he worked for a short time in a shoe factory, taught school for a year or two, then, after occupying positions with two business houses in Boston, entered the office of the

Treasurer of the American Board of Commissioners for Foreign Missions in that city, where he remained about sixteen years. In 1886 he found more congenial occupation as one of the editors of the 'Youth's Companion,' but he resigned this position in 1901 to devote himself exclusively to his own literary work. After leaving Weymouth he lived successively in Boston, Melrose Highlands, and Wellesley Hills, Mass., but since the winter of 1907 he had been at Santa Barbara,—whether as a mere visitor or as a permanent resident his friends were unable to learn.

As a boy and young man Bradford Torrey, though a great reader (eschewing fiction, however), was fond of walking in the woods and fields, but it was not till some time after he had left the country to make his home in Boston that he became especially interested in birds or in any form of outdoor study. He has told the story of his introduction to ornithology in a sketch entitled 'Scraping Acquaintance' included in the first of his books. This was not his earliest literary venture, however. He had written a paper on the birds of Boston Common, which, at the instance of friends who had heard him read it, he had sent to the 'Atlantic Monthly,' which printed it in February, 1883. Encouraged by this success, which had been quite unlooked for by him, he embarked on what finally became his life work as a writer of discursive essays on birds, flowers, and the world out of doors. Many of his essays made their first appearance in the 'Atlantic.' Others were printed in the 'Boston Transcript,' the 'Youth's Companion,' the 'Christian Endeavor World,' and elsewhere. His first book, 'Birds in the Bush,' was published in Boston in 1885. It was followed by 'A Rambler's Lease' (1889), 'The Foot-Path Way' (1892), 'A Florida Sketch-Book' (1894), 'Spring Notes from Tennessee' (1896), 'A World of Green Hills' (North Carolina and Virginia) (1898), 'Everyday Birds' (juvenile) (1901), 'Footing it in Franconia' (1901), 'The Clerk of the Woods' (1903), 'Nature's Invitation' (New Hampshire, Florida, Texas, and Arizona) (1904), and 'Friends on the Shelf' (literary criticism) (1906). Mr. Torrey also edited Thoreau's Journal in fourteen volumes (1906 and 1907). Shortly before his death he had sent his publishers copy for a book to be called 'Field-Days in California,' which is announced for publication in the early spring of 1913.

For many years Mr. Torrey spent a part of the spring, summer, or autumn at Franconia in the White Mountains region of New Hampshire, and many of his most delightful essays are records of his observations and reflections there, but he also visited other parts of New England (just over the line in the Province of Quebec too), and about 1894 he began going South for the late winter and early spring. He thus visited Florida, Tennessee, North Carolina, Virginia, Texas, Arizona, and finally California.

At the first meeting of the American Ornithologists' Union, in 1883, Mr. Torrey was made an Associate Member, and he was elected a Member in 1901, when that class was instituted. He was a Resident Member of the Nuttall Ornithological Club from 1884 to 1886. He published a paper on

'The Booming of the Bittern' in 'The Auk' for January, 1889, and an even dozen of General Notes at intervals from 1886 to 1905. He also contributed two articles to 'Bird-Lore' and during the years 1907-10 he printed twelve notes in the 'Condor.'

It was through his literary writings, however, that Mr. Torrey rendered his best service. He combined to a very unusual extent the scientific with the æsthetic habit of mind. He was always accurate and careful in his observations and statements, and he had a happy way of turning even his scientific doubts and disappointments to good account in a literary way, as when his long search for Ravens in North Carolina ended with the bagging of a 'brace of interrogation points.' His combination of enthusiasm with a humorous detachment was also one of his greatest charms as a writer, and one which made it possible for readers without any particular knowledge of or interest in birds to enjoy his writing almost as much as the confirmed bird-lover. Besides this he had a gentle and cheerful philosophy that led him to interest himself in his fellow men, whom he considered, after all, quoting Scripture as he was fond of doing, to be 'of more value than many sparrows.' The birds, as well as the trees and wild flowers which also occupied much of his attention, he regarded as a part of outdoor nature, and his essays are pictures of the landscape — of New Hampshire, Cape Cod, Florida, Arizona — no less than accounts of the birds he found there. His style is conversational, chatty we may call it, but exact and carefully considered, and he spared no pains in the preparation and revision of his copy for publication.

Mr. Torrey was a lover of music and for years a regular attendant at the Symphony concerts in Boston. His own instrument was the piano, upon which he was fond of improvising. In his social relations he was too modest and retiring to form a wide acquaintance, but he was much loved by the small circle of his more intimate friends, who found him always sincere and loyal and of an even, cheery temper, while no one could talk with him without being impressed by the fineness and rare purity of his character.

F. H. A.

We have just been advised of the death on January 8, 1898, of Valdemar Knudsen who was elected a Correspondent of the American Ornithologists' Union in 1888 when he was actively engaged in studying the birds of the Hawaiian Islands, making his home on Kauai. He at that time sent numerous collections to the U. S. National Museum which were described in papers by Dr. Leonhard Stejneger, who named *Puffinus knudseni* and *Himantopus knudseni* in honor of the collector. Mr. Knudsen was born in Norway Sept. 5, 1822.

MR. WILFRED H. OSGOOD of the Field Museum of Natural History returned in October from a nine months' trip in South America, having crossed the Andes of northern Peru and descended the Amazon River to its mouth. He was accompanied by Mr. Malcolm P. Anderson who has remained for

further work in eastern Peru and northern Brazil. At date of last shipment their collections of birds and mammals numbered over 2000 specimens including a very large number of species, since they were successful in obtaining a representation of three very distinct faunas, the arid west coast of Peru, the high Andean region, and the upper Amazon valley. On December 14, Mr. Robert H. Becker sailed from New York to join Mr. Anderson for continuation of the work during the coming year.

FOUR new 'habitat' groups of birds have been completed recently at the Field Museum of Natural History, respectively showing the Northern Loon, the Great Blue Heron, the Whooping and Sandhill Cranes, and the Golden Eagle, besides a few species of smaller size. They have been installed in a handsome quadripartite case of the style previously used for such exhibits and show considerable advance in technique, especially in the perfection obtained in the reproduction of various types of vegetation. All have large backgrounds by Mr. C. A. Corwin. The loon group shows two adult birds, nest and eggs, and scene in northern Michigan. The heron group includes several great blues and a 'rookery' of large nests in trees is represented on the painted background. The crane group contains three large 'Whoopers,' one of them in the beautiful tan-spotted immature plumage. A single adult Sandhill Crane is shown also and all four are placed in a beautiful setting in the brilliant fall colors of the vegetation along a small stream in northern Illinois. The Eagle group contains a pair of adult birds and their young in a nest on the side of a particolored cliff in the badlands of North Dakota. The background shows a picturesque bend of the Little Missouri River with soft-colored terraced buttes in the distance. The modeling and taxidermy of the four groups are by Messrs. Julius Friesser and Leon L. Pray.

MR. LEO E. MILLER, who met with so much success in Colombia collecting for the American Museum, together with Mr. Francis X. Iglseder, as his assistant, sailed from New York City on November 26, for South America, for the purpose of continuing the investigation of the birds and mammals in the interests of the American Museum.

ON December 10 Dr. John C. Phillips and Dr. Glover M. Allen arrived in Port Said, Egypt, after a voyage which their cabled messages describe as wholly pleasant. With few delays they will proceed to Khartoum and then meet a camel caravan which is ready and waiting their arrival. The plan is to spend several months collecting for the Museum of Comparative Zoölogy in the Atbara River region near the borders of the Sudan and Western Abyssinia. Especial attention will be paid to preserving birds and mammals but efforts will also be made to secure representative series of other groups, such as reptiles, amphibians, fishes and insects. Dr. Phillips hoped to be able to secure, in Khartoum, natives who had been employed on previous expeditions and thus secure skilled assistance in collecting.—T. B.

MR. W. E. CLYDE TODD with two companions made a trip to James Bay during the summer under the auspices of the Carnegie Museum and the National Geographic Society. They left Pittsburgh, May 15 last, and travelled by canoe from the terminus of the Temiskaming and Northern Ontario Railway to Moose Factory. Here a small sailing vessel was secured and the southern and eastern shores of James Bay were explored. The unusual weather conditions and failure to secure suitable guides prevented them from going farther north as they had expected. Good collections of birds and mammals were secured, however, and much data on distribution and migration. The expedition returned November 16.

WE learn from Mr. Robert Ridgway that Volume VI of the Birds of North and Middle America is being pushed rapidly to completion. It will comprise the Picidae, Capitonidae, Ramphastidae, Galbulidae, Bucconidae, Alcedinidae, Todidae, Momotidae, Caprimulgidae, Nyctibiidae, Strigidae, Aluconidae, Psittacidae and Cuculidae. The manuscript covering the first ten families is finished, except for the genus *Chordeiles*, while that of the remaining four is partly completed. The portion relating to the Woodpeckers is already in type.

Our readers will also be glad to know that the publishers of Mr. Ridgway's long expected new 'Nomenclature of Colors' have promised some copies by the first of January, 1913.

THE project of establishing wild-fowl refuges in the marsh lands of Louisiana and Texas originated by Mr. E. A. McIlhenny and Charles W. Ward received a great impetus from the purchase of Marsh Island Louisiana, by Mrs. Russell Sage, announced early in October, 1912. This tract comprises 75,000 acres and adjoins the Ward-McIlhenny Wild Fowl Refuge, and the Louisiana State Wild Fowl Refuge, which together cover 60,000 to 70,000 additional acres.

Gunning on the Marsh Island tract will be absolutely prohibited and it will form a permanent refuge for all kinds of wild bird life.

'Forest and Stream' for October 12, 1912, gives a detailed account of this region based upon investigations by Mr. George Bird Grinnell who visited Marsh Island at the instance of Mrs. Sage prior to the purchase.

AT the last meeting of the American Ornithologists' Union, Mr. A. C. Bent, who is engaged on the continuation of Major Bendire's work on the 'Life Histories of North American Birds' presented a 'report of progress' designed to show what he had actually accomplished and also to arouse more interest among the members of the Union in an undertaking which can never be completed by the unaided efforts of any one man.

For over twenty years Mr. Bent has devoted his spare time to visiting various points of ornithological interest in North America for the purpose of collecting the information, photographs and specimens necessary for an extensive work on the breeding habits of North American birds.

During this time he has visited both northern and southern Labrador, Newfoundland, all of the southern provinces of Canada from Nova Scotia to British Columbia, all the Atlantic and Gulf states from Maine to Louisiana, many of the inland states and the Pacific coast from Puget Sound to northern Alaska, including the Aleutian Islands. He has made a more or less extensive field acquaintance with over 500 different birds and has accumulated a large amount of notes, photographs and other material, which form the basis of his personal contribution to the work.

Since he undertook to continue Major Bendire's work on the *Life Histories of North American Birds* he has, with some clerical assistance, looked through nearly all of the more important ornithological publications which he could conveniently reach, and made a bibliographical index to such published notes on life histories as he might care to use, covering all the species which are to be included in the next volume to be published. Much further work in this direction still remains to be done, for which he is open to receive offers of assistance from competent ornithologists who are willing to undertake this work and for which he is willing to pay a reasonable price for the time and labor involved; this work should be done by someone who has access to one or more large libraries.

Major Bendire's first volume began with the Gallinæ, A. O. U. number 289, and his second volume ended with the Icteridæ, A. O. U. number 513, including 223 species in the two volumes. Considering the fact that comparatively little is known about many of the water birds and that many of the ocean wanderers and stragglers need little more than passing mention, as American birds, it seems safe to plan on covering all of the first part of the A. O. U. Check-List, up to where he began, in two volumes. The present plan, which is subject to revision, is to have the first volume cover the Colymbidæ to the Anatidæ, at least as far as the Geese; as the life histories of many of the Tubinares will be decidedly brief, it may be possible to include all of the Anatidæ in this volume.

The work of gathering information, material and contributions for the *Life Histories* has been partially organized on a very satisfactory basis. As it is impracticable, if not impossible, for any one man to know and keep in touch with all of the reliable observers and contributors in North America, it has seemed best to place this work in the hands of competent leaders in various parts of the country, who are fitted and willing to take charge of the work in their particular sections, to arouse interest among their acquaintances in collecting information and material, to secure contributions from competent and reliable observers and to pass judgment on the accuracy and reliability of whatever they send in for publication. The following well known ornithologists have already generously volunteered to serve in this capacity:—

Rev. W. W. Perrett for northern Labrador.

Dr. Chas. W. Townsend for southern Labrador.

Mr. W. E. Saunders for Ontario and Quebec.

Mr. Arthur H. Norton for Maine.

Mr. Witmer Stone for Eastern Pennsylvania and Southern New Jersey.

Mr. H. H. Bailey for Virginia.

Mr. T. Gilbert Pearson for North Carolina.

Mr. Arthur T. Wayne for South Carolina.

Prof. Lynds Jones for Ohio.

Mr. Benj. T. Gault for Illinois.

Prof. Walter B. Barrows for Michigan.

Dr. Thos. S. Roberts for Minnesota.

Mr. Chas. R. Keyes for Iowa.

Rev. P. B. Peabody for Kansas.

Mr. Edw. R. Warren for Colorado.

Mr. Aretas A. Saunders for Montana.

Mr. Allan Brooks for British Columbia.

Mr. S. F. Rathbun for Washington.

Mr. Wm. L. Finley for Oregon.

Mr. A. B. Howell for California.

Nearly all of these collaborators have reported more or less progress in arousing interest in the work among their correspondents and considerable material has been sent in and filed away for future use, but in far too many cases the results of their labors have been disappointingly small. This is due to the following causes:—

(1) The water birds have always been the most neglected class of American birds, because to many ornithologists they are the most inaccessible and the least interesting. Consequently there is little information about them available. Unfortunately the information about the water birds is wanted first.

(2) Throughout the settled portions of North America there are comparatively few water birds still breeding and they are becoming scarce in many sections even as migrants. In regions where water birds are still abundant there are very few competent observers who have time to devote to bird study.

(3) The third cause, the only one of the three that can be removed, is the apathy and indifference of the men who could give the information wanted if they could only be induced to do so. Many good observers have promised to contribute but through procrastination or for lack of time have failed to do so as yet. Many men seem to prefer to publish their notes in the current periodicals, where they appear promptly. But there are a host of others whose interest has yet to be aroused to the necessity of cooperation, if this work is ever to be brought to a successful conclusion. It is to be hoped that collaborators will succeed in arousing more enthusiasm in this work so that the publication of the next volume may not be too long delayed.

Eighteen life histories have already been written, but as they contain mainly the results of Mr. Bent's personal observations, together with such quotations from published material as seemed desirable to make them more

nearly complete, they are open to additional contributions from others, as well as final revision. Preference will always be given to original contributions, quotations from published literature will be reduced to a minimum and contributors will be given full credit for whatever material they furnish.

Mr. Bent already has in his own field notes nearly enough material to write the life histories of over half of the species to be included in the next volume, but, even after exhausting all the material contained in the published literature on the subject, there are surprisingly few species on which we have sufficient material to write even fairly complete life histories. A large number of printed lists of the information wanted have been distributed and they will be freely furnished to all who care to contribute. An extensive study of the published material brings to light some interesting facts; a vast amount of data has been published on migration and distribution, nesting habits have been written up more fully than any other phase of the subject and considerable has been written about the food of birds, particularly from an economic standpoint; but the exact period of incubation and the development of the young has been carefully worked out for very few species, the sequence of plumages in the water birds has been sadly neglected and comparatively little has been published on winter habits.

For many of the water birds only the most meagre life histories could be culled from the published literature on the subject. To collate and compile in an extensive work on this subject all that has been published relating to the life histories of North American birds, is an undertaking well worth while, but the value of any work of this kind is greatly enhanced by a liberal addition of original material, which was a marked feature of Maj. Bendire's work.

Mr. Bent has several years' work planned out in northern exploration for the study of the breeding habits of the more inaccessible species, but, in order to do this field work, he must rely largely on others for the information wanted about other more accessible species. There are few ornithologists who cannot find the time to study effectively some phases of the life history of one or more species, which are readily accessible.

There is much information which is badly needed and which could easily be obtained; much information of value lies buried in the field notes of nearly every observer; even fragmentary notes are often valuable as contributions to life histories; and it is only by collecting as much of this material as possible that we can hope to get anything even approaching completeness.

Finally, Mr. Bent thanked all those who have helped in the work, so far, and assured them that they will receive full credit for what they have done. He desires more collaborators to take the leadership in sections not covered in the foregoing list and should be glad to receive offers or suggestions. This much needed work on the Life Histories of North American Birds is now a living issue and it is being pushed vigorously, and we hope that this plea for help will not prove useless and that American ornithologists will show their interest in the work by cooperating to make it successful.

MR. WILLIAM LEON DAWSON, well known as the author of 'The Birds of Ohio' and 'The Birds of Washington,' announces the early publication of 'The Birds of California,' a work of over 1500 pages, with 750 half-tone cuts and 24 full-page color plates from original paintings, by Mr. Allan Brooks. The work is by Mr. Dawson with the cooperation of the Cooper Ornithological Club, and is announced to comprise a complete scientific, and popular account of the more than 500 species of birds found in the State of California, with analytical keys and other helps to ready identification, representative local lists and other appropriate critical matter.

Like 'The Birds of Washington' there will be several editions differing in illustrations, quality of paper, etc. The entire issue is limited to advance subscriptions. The Students Edition will sell for \$15 to \$30 according to the style of binding, and Booklovers' Edition limited to 500 copies, at \$45; Large paper Edition de Luxe, limited to 250 copies, at \$67.50; Sunset Edition de Luxe, limited to 250 copies, at \$110; Stockholders' Edition de Luxe, limited to 250 copies, at \$150; and the Extra Illustrated Patrons' Edition De Grand Luxe, limited to 100 copies at \$1000. The last is in four volumes, the other editions in three.

THE first Annual Dinner of the Linnæan Society of New York was held at the Hotel Endicott in that city on the evening of December 17, 1912, and was attended by over sixty members and invited guests.

The object of the dinner was two-fold: to bring the members together in an informal, social way, and to express to Mr. Frank M. Chapman, the guest of honor, the Society's appreciation of his invaluable services to ornithological science through his well-known work in popularizing the study of birds.

President Jonathan Dwight, Jr., acted as toastmaster, and among those at the speakers' table were, besides Mr. Chapman, Henry Fairfield Osborn, Frederic A. Lucas, John Burroughs, Ernest T. Seton, A. K. Fisher, John H. Sage, T. Gilbert Pearson, George Bird Grinnell, and Spencer Trotter.

The Linnæan Society was founded in March, 1878, with but ten members, including such men as H. B. Bailey, Ernest Ingersol, Dr. C. Hart Merriam, John Burroughs and Dr. A. K. Fisher. Its object has always been to promote the study of natural history, and its growth and increasing influence since those early days have been most gratifying.

Mr. Chapman became a member of the Linnæan early in his career and has remained closely identified with its activities. His unremitting efforts in stimulating interest in bird study are too well-known to need detailed mention here, and as tribute to them Dr. Dwight, on behalf of the Society, presented him during the dinner with the Linnæan Medal.

The unqualified success of this first annual dinner of the Linnæan leads to the hope that it will become a permanent feature of the Society's active season.



NEST OF SWAINSON'S HAWK (*Buteo swainsoni*).